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CONTENTS

THE WHOLE OF THE LITERARY MATTER IN THE LANCET IS COPYRIGHT

ADDRESSES AND ORIGINAL ARTICLES

Progress in the Treatment of Fractures. By R. SALISBURY WOODS, F.R.C.S.—(*Illustrated*) .. 307

A New Factor in the Production and Cure of Certain Macrocytic Anæmias. By LUCY WILLS, M.B., P. W. CLUTTERBUCK, D.Sc., and BARBARA D. F. EVANS, M.R.C.S.—(*Illustrated*) 311

Tuberculous Lesions in Association with Genito-urinary Tuberculosis. By M. C. WILKINSON, M.B. 314

Genito-urinary Tuberculosis: With a Review of 100 Cases. By FRANK HARVEY, F.R.C.S. 316

The Effect of an Anti-Vi Bacteriophage on Typhoid Infection in Mice. By I. N. ASHESHOV, JOYCE WILSON, and W. W. C. TOPLEY 319

Œstradiol Benzoate Therapy in Depressions at the Menopause. By M. S. JONES, M.R.C.P., T. N. MACGREGOR, F.R.C.S., and H. TOD, B.Sc. 320

CLINICAL AND LABORATORY NOTES

Congenital Syphilis in a Monovular Twin. By L. S. PENROSE, M.D. .. 322

Micrognathia in the Newborn. By C. PAGET LAPAGE, F.R.C.P.—(*Illustrated*) 323

MEDICAL SOCIETIES

Royal Society of Medicine: Section of Medicine: Congenital Heart Disease 324

Liverpool Medical Institution: Congenital Cystic Disease of the Lungs—Prostatectomy with Closure 325

INDEX NOTICE

Index to THE LANCET, Vol. II, 1936 336

REVIEWS AND NOTICES OF BOOKS

The Extra Pharmacopœia: Martindale. Published by the Council of the Pharmaceutical Society of Great Britain 327

The Truth about Bright's Disease. By William R. Ohler, M.D. 327

Disability Evaluation: Principles of Treatment of Compensable Injuries. By Earl D. McBride, M.D. 327

The British Journal of Surgery 328

LEADING ARTICLES

RENAL TUBERCULOSIS 329

PENNY-IN-THE-SLOT PATHOLOGY 329

THE RUSSIAN TRIALS 330

MEDICAL HONOURS 331

ANNOTATIONS

Early Cancer and Radiotherapy 332

Health of the Royal Air Force 332

Royal National Hospital for Rheumatic Diseases 333

Blood Changes in Eclampsia 333

Experiments with a Micro-viscosimeter 334

Pneumonia in Childhood .. 334

A New Hæmopoietic Factor? 334

The Surgical Relief of Impotence 335

Limited Quarantine 335

Cambridge Degrees 335

The Consequences of Philosophy 335

Floods in the Ohio Basin .. 336

Halley Stewart 336

SPECIAL ARTICLES

Hearing-Aids: A Report to the Medical Research Council 340

Medicine and the Law: Hire-purchase Research 341

Paris: The Commercial Irradiation of Foods 342

Ireland: Medical Research in the Irish Free State .. 343

B.M.A. and T.U.C. 351

New Year Honours 352

A Clearing-house for Hospital Emergencies in London 358

PRINCIPLES OF MEDICAL STATISTICS

VI.—Further Problems of Sampling: Proportions 337

GRAINS AND SCRUPLES

From A Rover (I) 344

PANEL AND CONTRACT PRACTICE

Understudying the Dentist 345

CORRESPONDENCE

Rest Houses for Rheumatoid Arthritis (Mr. W. A. Cochrane, F.R.C.S., Dr. Bernard Schlesinger, Mr. A. Woodmansey, M.Sc.) 346

Dermatitis and Motor Fumes (Dr. John T. Ingram) 347

Influenza and Leucopenia (Dr. J. Graham Willmore) 347

Intubation for Perforated Gastric Ulcer (Prof. G. Grey Turner, F.R.C.S.) 348

Appendicitis and Alarm Reaction (Prof. Horst Oertel, M.D.) 348

A Bill to Secure Medical Privilege (Sir E. Graham-Little, M.P.) 349

Dysostosis Craniofacialis (Dr. C. Allen) 350

Radiogram and Radiograph (Dr. J. F. Brailsford, Dr. S. Cochrane Shanks..... 350

Nasal Sinusitis in Childhood (Mr. C. Hamblen Thomas, F.R.C.S.) 351

When was John Hunter Born? (Mr. R. K. Howat, F.R.C.S.) 351

THE SERVICES

Royal Naval Medical Service—Royal Army Medical Corps—Royal Air Force — Indian Medical Service—Deaths in the Services 352

OBITUARY

Henry Alexander Osborn, D.M. 353

PARLIAMENT

Factories Bill 354

Maternity Services in Scotland 354

Question Time: Experiments on Animals—Death-rate among Pensioners—State Management of the Drink Traffic — Health Insurance Ophthalmic Regulations—British Pharmacists and Anti-gas Work—The Budget and Family Allowances 356

PUBLIC HEALTH

Accredited Milk 359

Ophthalmia Neonatorum.. 359

Welsh Tuberculosis Scheme 359

Influenza—(*Illustrated*).... 360

Small-pox in Failsworth .. 360

Infectious Disease in England and Wales 360

MEDICAL NEWS

University of Oxford 361

Royal College of Physicians of London..... 361

University of Edinburgh.. 362

Scottish Conjoint Board.. 362

Empire Tuberc. Conference 362

University of Liverpool ... 362

Royal Society of Medicine 362

Improvement of Eyesight. 362

Association of Industrial Medical Officers 362

People's League of Health 362

Samaritan Free Hospital for Women 363

Advice on Birth Control .. 363

Biochemical Society 363

Institute of Psycho-Analysis 363

Royal Society of Edinburgh 336

Fellowship of Medicine.... 343

Research in Diseases of the Blood 353

NOTES, COMMENTS, AND ABSTRACTS

The Future Status of the Clinical Pathologist. By S. C. DYKE, F.R.C.P.... 365

A Psychotherapist's Training 367

Open-Air Schools 368

Municipal Year Book 368

Medical Diary 363

Appointments 364

Births, Marriages, Deaths 364

Vacancies 368

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PROGRESS IN THE TREATMENT OF FRACTURES *

By R. Salisbury Woods, M.D. Camb., F.R.C.S. Eng.
FORMERLY MEDICAL OFFICER IN CHARGE OF THE FRACTURE CENTRE, 4TH LONDON GENERAL HOSPITAL

In the last 25 years enormous improvements in treatment, comfort, and results have been brought about by the mass experience of the late war. But since then the advance has happily continued; sick wastage from the majority of fractures has now been reduced to a minimum, and permanent disability should be rare or negligible if modern treatment is carried out.

The Pre-War Position

For many years before the war it had been the custom to reduce fractures by manual traction under general anæsthesia. The injured limb was then swathed in cotton-wool and put up in a plaster-of-Paris casing. But, as the initial swelling subsided, the loose layer of wool allowed of considerable movement at the site of fracture. Moreover, no attention was paid to the function of the limb, which merely lay in bed and suffered atrophy from disuse. Even if, and when, crutches were employed, no normal weight-bearing was allowed, or indeed possible, until sound union had occurred.

RESTORATION OF FUNCTION

For some years before the war, however, the doctrine of early massage and physiotherapy had become fashionable, and plaster-of-Paris fell into desuetude. Padded wooden splints, like the "back-splint" with foot-piece and side-pieces for the leg, the "long Liston" for the thigh, and the "internal angular" for the forearm, became standardised. These offered the attraction of easy partial removal in order that the limb could be given "massage and electricity," the aim of which was to counteract the stiffness of neighbouring joints and weakness from disuse, which were found naturally to follow a fracture. But restoration of function to the injured person was very painful and slow. In major lower limb fractures, weight-bearing was not attempted (however gingerly) until after 8–10 weeks, the atrophied muscles required at least a further 2 months to regain their full power, and joints were often impaired for life. Loss of employment and sick wastage lasted not uncommonly for at least 6–12 months; and as surgical specialist to insurance companies I still see such results. In fractures of the femur, however, an advance had been made, in that the principles of suspension and axial traction were brought into play by the Hodgen frame splint in conjunction with the weight and pulley.

FIXATION OF FRAGMENTS

Just before the war open operation and fixation of the fragments by plates and screws, wires, or intramedullary pegs had come into vogue through the work of Sir Arbuthnot Lane, Dr. Lambotte, and others; and in 1915 Hey Groves's book on "Modern methods in treatment of fractures" was still mainly concerned with "operative treatment," although he decried it for "open" fractures. During the war every gunshot fracture—"G.S.W. with fracture"—was necessarily open and infected. Consequently the wound was dealt with by excision of skin-edges and toilet of the track, but no internal splinting was attempted. This was on the principle that no open fracture should be plated, owing to the aggravation and prolongation of sepsis by the introduction of foreign bodies.

CONTINUOUS TRACTION

As operative fixation was therefore contra-indicated in treating the wounded, the principle of continuous traction, probably adapted from Hodgen's splint, regained its pride of place and developed out of all recognition. Traction reached its height of fame and efficiency when used for fractures of the femur in conjunction with the Thomas's splint, suspended and counter-poised from a Balkan beam. The actual pull was applied either by adhesive media, or by direct skeletal traction.

Adhesive media.—Strips of adhesive plaster on each side of the limb, leading off to a stirrup and weight over a pulley. These were apt to snap suddenly after several weeks, causing great pain and alarm, and needed renewal. They also irritated the skin, and could not of course be applied at all where the surface was badly involved below the knee. Nevertheless, the method was generally satisfactory for fractured femurs, and it was the most widely used.

Sinclair's foot-piece consisted of a wooden sole fixed firmly to the dorsum of the foot by overlapping strips of glued tape. From its margins, small rings enabled the coupling of a tractile force. Many swore by this, but I confess I swore *at* it, because—perhaps from lack of previous continuity of treatment and ideas—a number of cases arrived at the centre where I was employed, with sloughing of the skin and even of the tendons of the dorsum of the foot. At any rate it was not fool-proof.

Direct skeletal traction took the form of (1) the ice-tong calliper, gripping into femoral condyles; (2) Steinmann's pin, transfixing the tubercle of the tibia; and (3) Finochietto's stirrup, passing anteriorly to the tendo Achillis, and pulling on the superior surface of the os calcis. It enabled far greater force to be applied in refractory cases than could be withstood by adhesive devices. Personal experience of all varieties showed that each had its virtues. For instance Finochietto's stirrup was reserved for cases where the skin above was so severely damaged that an extension could not otherwise be applied. The danger of sepsis supervening was exaggerated, even in cases of gunshot wounds, and we certainly did not meet it. This factor of *suspension* added enormously to the comfort of the patient, especially in the dressing of posterior wounds and the use of the bed-pan.

Continuous traction gave splendid results, and in the fracture wards of the 4th London General Hospital (Woods 1923), despite sepsis and severe comminution, the average shortening was less than 1 cm., which does not interfere with function, thanks to compensatory tilting of the pelvis. Ambulatory treatment in a walking calliper followed in 4–8 weeks, with all the benefits of physiological activity. The principle was also used in fractures of the upper limb. It was simple, safe, and convenient on active service; for the Thomas's splints were interchangeable for right or left limbs, and the same pattern could be used in the trenches, at the base, or in England. Continuous traction—from a Kirschner wire through the tubercle of the tibia—is even now the best modern treatment for fractures of the femur.

Post-war Progress

DIRECT OPERATION AND INTERNAL SPLINTING

Nevertheless, surgery has its fashions, and on returning to civil life with complete asepsis and

* A lecture to the Cambridge University Medical Society.

"every modern convenience," there was a tendency to maintain the reduction of difficult fractures by the attractive gadgets that were at hand for the purpose of internal splinting. Most of us resorted to them, and on the whole the patients did well. Anything definitely fixative seemed preferable to months of continuous traction. Only really awkward fractures were operated upon, when the splints in use failed to meet the case, and compound ones never.

A few examples may illustrate operative treatment.

CASE 1.—A very muscular undergraduate on Nov. 7th, 1924, sustained a comminuted fracture of his right femur in its middle third while playing rugger. It was put up on a Liston splint, and he was transferred at about 6 P.M. to a nursing-home and referred to me. A Thomas splint, with 12 lb. strapping extension, was applied and suspended from a Balkan beam. Nov. 9th: X ray report unsatisfactory. Nov. 11th: open operation. A 10 in. incision on lateral aspect of right thigh; fragments levered into accurate alignment by lion forceps; main shaft repaired by Lane's plate and 6 screws. The third fragment (on the postero-medial aspect) was then wired to the reconstructed shaft (Fig. 1). Nov. 17th: flexing iron added to Thomas's splint; knee movements good. Nov. 20th: extension removed. Dec. 20th: up on crutches and a walking calliper, after 6½ weeks. June 8th, 1925: knee movements full; walks without a limp; has played tennis.

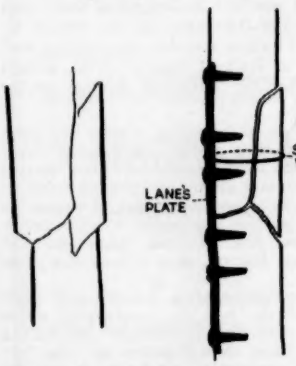

FIG. 1 (Case 1).—Comminuted fracture of right femur (anteroposterior view); fixation with Lane's plate, the third fragment being wired to reconstructed shaft.

It is relevant here to recall that in 1922 Hey Groves had written: "I believe that operation ought to be the routine treatment for the majority of complete fractures of the shaft of the femur in adults of active life."

CASE 2.—A schoolmistress, aged 32, on Dec. 18th, 1926, received a fracture of the upper end of tibia, into the knee-joint, in falling from bicycle. Put up on a Thomas's splint where she lay; 12 lb. extension applied on admission to a nursing-home. Dec. 23rd: radiograms showed a fracture of the right tibia into the middle of the knee-joint, with outward dislocation of outer fragment of tibia on femur, the joint completely unstable, and torsion of articular surface of tibia. Dec. 24th: fracture exposed by operation, and outer edge of tibial fragment united by two short oblique plates to the main shaft, after much difficulty in manœuvring; knee-joint full of blood, which was evacuated, and the capsule was sewn up; fascia and fat brought over screws. She was put back on Thomas's splint. Gentle movements to the knee-joint after a week. She went back to teaching in 2 months. In 1936 she could practically sit on her heels while kneeling and there was no disability. She does climbing and plays tennis and other games.

CASE 3.—On Feb. 25th, 1928, an undergraduate playing rugger suffered a severe backward dislocation of his ankle-joint, with vertical fracture of shaft of tibia into joint, and of lower third of fibula, which occurred when he was tackled, while turning to kick. The dislocation was easily reduced, but the problem was how to promote early movement when upper mortice for the astragalus was entirely unstable. In the contemporary view, such movements would shed osteoblasts into the disrupted joint; on the other hand, the avoidance of this by prolonged immobilisation would also have produced a stiff ankle from adhesions. It therefore seemed proper to secure the mortice by open operation, and then to begin early movements.

Feb. 29th: operation with axial incisions on medial and lateral aspects of lower third of leg; both fractures were exposed. In that of the tibia, the periosteum was sewn tightly over, to clamp the fracture, after more accurate reposition. In the fibula the position was improved by moving some intervening muscle, and the fragments were secured by stout silver wire; suspension in Neville's swing cradle. Ankle movements from very beginning. Regained almost complete range in 10 days.

April 17th: Mr. C. H. Frankau saw him in London and wrote: "The movements are practically perfect." April 19th: started walking with shoe raised on the inner side. Eventually no thickening, no disability, and *played rugger again*. When seen in 1935 after 7½ years, it was impossible to distinguish his injured ankle from its fellow.

It may be recalled that in 1908 Clinton Dent, writing on the after-effects of injuries among the police, stated that he "had difficulty in remembering a case of Pott's or Dupuytren's fracture which had sufficiently recovered to resume police work."

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1. Local or regional anæsthesia.
2. Immediate and accurate reduction of the displaced bone ends.
3. Absolute fixation of the replaced fragments until union has occurred, by a non-padded plaster-of-Paris splint, helped in some cases by traction wires inserted through the shaft at each end, and embedded in the plaster.
4. Immediate functional restoration of movements, including (in the lower limb) weight-bearing where possible, while the necessary fixation is maintained.
5. No open operations, even in "closed" fractures, except where there is separation of the fragments—e.g., of the olecranon or patella—or in some fractures involving joints, in which the joint surface is twisted—e.g., upper and lower ends of humerus, or in upper end of radius, in subcapital intra-articular fractures, cf., neck of femur; and I might add, in Case 2, of the upper end of the tibia, the articular surface.

Böhler includes among "errors in the treatment of recent open fractures":—

10. Setting the fracture in the open wound by means of levers and instruments. This is liable to force infective material into the spongy bone and marrow cavity.
11. Bone suture by the use of large foreign bodies, particularly plates and screws. Infection and osteomyelitis are the common results of this.

And further he states:—

"Operative treatment involves great dangers, because in every fracture the soft parts are also severely injured and because many vessels have been torn by the causative violence. . . . At the operation, the bone fragments must be widely exposed, and further vessels torn. Most dangerous of all is the operative fixation of fragments in open fractures—and this according to many surgeons is the very object of the operation."

In normal tissues, bone operations conducted with suitable technique are well-nigh without danger. Of ununited fractures, Böhler says:—

"Faulty position of the fragments and interposition of soft parts may be the cause. Most frequently it lies in unsuitable treatment." Primary operative treatment by means of buried foreign bodies, particularly Lane's plates, is the frequent cause of pseudarthrosis. Henderson of the Mayo Clinic found that in 211 cases operated on.

for pseudarthrosis, 66 per cent. were due to fixation with Lane's plates, and Scudder found that 70 per cent. of 32 cases resulted from the same cause.

"Gray of San Francisco has examined 34,725 cases, and has found that the period of recovery of fractured femurs treated by operation was twice as long as that of those treated conservatively; that the expense of treatment was three times as great, and the amount of compensation doubled. In the lower leg of those subjected to operation, expense and compensation were about 50 per cent. higher than in the others."

ORDINARY SPLINTS NOW OBSOLETE

These really basic requirements, as preached by Böhler, of accurate reduction, fixation, and function, are not satisfied by most of the splints whose employment was a standard routine in hospitals until the last few years, and which are still in current use in a great many places. To take as a common example the back splint with foot-piece for fractures of the tibia and fibula, with or without Clines's side splints, and whether suspended from a Neville's cradle or not, this contraption never properly immobilised the fragments of a fractured tibia and fibula, and was useless for transport in comfort. The reduction was usually far from accurate, or

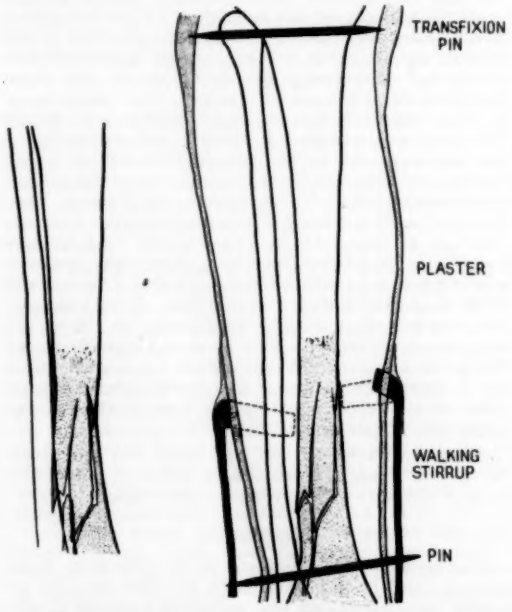

FIG. 2 (Case 4).—Multiple fractures of right tibia (antero-posterior view). Left: after manual traction only; right: after 3 weeks weight bearing beginning within one day of operation. Fixation with transfixion pins and plaster cast, position being maintained by 45 lb. of traction with Kirschner wire through os calcis until the cast had set.

at any rate was not secure; the resulting distortion of vessels produced much œdema, and the vertical foot-piece denied the natural position to the foot. To remedy this, the limb was subjected to daily massage with or without "electricity," which necessitated interference with the splint and with the fractured leg, and could hardly have contributed to the absolute fixation that is now held to be essential in treatment. No function was attempted for weeks, and no weight-bearing until sound union had taken place in about 2 months.

In modern treatment, fractures of the tibia and fibula are accurately reduced under local anæsthesia, by screw-traction if necessary, and the position absolutely maintained by a non-padded plaster-of-Paris splint of Cellona bandages, which sets immediately. In simple and, particularly, transverse fractures walking may be begun almost at once. In oblique and multiple fractures where "telescoping" is to be feared, ambulatory treatment is nevertheless possible by transfixion-fixation of the fractured tibia by means of stout transverse steel pins above and below the fractures, whose projecting ends are embedded in the irregular cylinder of plaster. The saving in sick wastage and hospitalisation is nothing short of dramatic, and *function* replaces the usual dreary and expensive ritual of months of physiotherapy.

CASE 4.—An undergraduate who was playing hockey on Oct. 23rd, 1936, was tripped by a stick and fell, sustaining severe injury to his left leg. Tremendous swelling over the lower half of the tibia; ankle inverted; obvious crepitation. By manual traction, under local anæsthesia, the fractures were reduced, and the limb put up in a cellona cast from sole to mid-thigh. Oct. 24th: radiography showed multiple fractures (Fig. 2), and although the position had obviously been greatly improved there was some angulation of the tibia laterally; and even the fibula itself, though intact, was bent outwards. It was therefore decided that this must be further improved and sick wastage minimised by operation.

Oct. 25th: the plaster cast was removed under anæsthesia, the leg cleaned up, and sterilised. A Kirschner wire was drilled through the os calcis, and screwed taut in a Max Page stirrup. This was then connected to a screw-traction apparatus, with spring-balance, the knee being flexed over a bar in a Böhler extension frame. The fragments were subjected to a 45 lb. pull, and manipulated into alignment. The angulation being corrected, tension was maintained while stout transfixion-pins were bored through the tibia above the ankle-joint, and through the tuberosity, and left with their ends projecting. The limb was then put up in a mid-thigh cellona cast by the usual technique, thereby embedding the pins and the Kirschner wire in a rigid, irregular cylinder. The wire was then withdrawn (releasing traction), and the punctures sealed. The alignment appearing to be perfect, a walking-stirrup was applied, and the projecting spikes padded with plaster knobs. Patient was radiographed again, and alignment now seen to be perfect.

Oct. 26th: he was very well; toes warm; no œdema. He was encouraged to walk with sticks about 10 yards and back again without discomfort, *20 hours after operation.*

Oct. 31st: he walked about when he felt like it, and had already walked up and down the stairs without help. He was discharged to go back to college, 6 days after operation.

Nov. 12th: he had dined in hall, attended lectures, and walked about the town. He had no pain, and had never used a crutch. Radiograms show perfect alignment of tibia (Fig. 2) with slight curvature of fibula.

By analogy with a similar case published (Woods 1936) there was every reason to hope that, when the plaster was removed about 10 weeks after operation, the patient would regain full movements of the knee and ankle almost immediately. Further, the usual weeks or months of "massage and electricity" would be almost, if not entirely, eliminated, by the active functioning of the limb from the beginning; and as regards the troublesome œdema which usually follows these fractures, by the temporary use of a firm Elastoplast "puttee" to the mid-thigh, as soon as the cellona cast is removed.

Jan. 23rd, 1937: In fact, a below-the-knee cast was applied after 8 weeks and worn for a further 3 weeks, the patient being away from Cambridge. The fractures are soundly united in perfect position, and there is no disability beyond lack of training.

Transfixion-fixation may also be used by means of Kirschner wires, drilled through the radius and olecranon, for those fractures of the forearm in which perfect reduction cannot otherwise be attained or maintained.

Other examples of obsolete splinting are the common splints used for a Colles's fracture, such as Carr's, "cock-up," &c. These, too, were usually employed after imperfect reduction; and anæsthesia, if any, was general rather than local. They were rarely comfortable, lacked complete control, and moreover were also removed for daily massage, and later for movements as well, in the belief that a stiff wrist-joint would follow immobilisation. The hand was not used for up to 3 weeks. Nowadays, immediate reduction is followed by complete fixation in a non-padded cellona splint, with the wrist-joint half-way between flexion and extension, and between pronation and supination, for 3–4 weeks. The fingers are moved immediately the plaster has set, followed by pronation and supination of the forearm. The shoulder- and elbow-joints are moved with the hand behind the back, and over the head. Exercises with a puller-machine may begin on the third or fourth day. It is only necessary to carry the arm in a sling for a few days, and after 2–3 days the hand can be used for light duties, such as writing and sewing, and for wood-cutting in 7 days. It is particularly pleasing to women to be able at once to arrange their hair and to tie their aprons. The more the patient works, the better his progress. When the cast is removed the movements at the wrist are full, free, and painless, and the ultimate disability nil.

SOME DIFFICULT FRACTURES

Fractures of the navicular (scaphoid) were formerly regarded as very intractable, liable to non-union; and operation for removal often followed. Modern treatment in recent cases is similar to that of a Colles's fracture, except that the wrist is put up slightly extended, and in ulnar abduction, and that it is left absolutely immobilised for at least 6 weeks. Radiography is then repeated, and obstinate cases *may* take as long as 4 months. Böhler himself was successful in obtaining bony union and complete mobility of the wrist in 158 cases, without a single exception. The delicate blood-supply of the scaphoid has to be re-established from the peripheral into the central fragment, and if any movement of the wrist is permitted, the fragments glide over one another and the growing vessels are severed. Consequently the orthodox treatment of massage and passive movement should never be employed. Indeed, it was wholly responsible for the previously bad results.

Fractures of the shaft of the femur.—The principle of continuous traction, elaborated from the experience of the late war, still holds the field here, save that direct skeletal traction has developed, and practically replaced the alternative methods depending on adhesive plaster, or glue—e.g., Sinclair's foot-piece.

A transfixion-pin is introduced through the tubercle of the tibia under local anæsthesia. It is more rapid, involves less movement of the fractured limb (shock and damage), and enables much greater tractile force to be exerted. The pin is removed in 3 weeks, lest the knee-joint should become lax, and an adhesive extension is then adopted; but the plaster should include the whole thigh, so that it grips the whole of the muscle cylinder that causes shortening. Another is similarly applied to the leg. Each extension is attached to separate weights over pulleys, and we have a picture of war-time axis-traction. Weight-bearing is usually safe in about 8 weeks, but is not allowed until the patient can lift the limb easily and without pain, and until the site of the fracture is no longer tender on pressure. A firm supporting puttee of elastoplast is then applied for 3 weeks, from the webbing of the toes to the thigh above the fracture. This is a great advance in the prevention of the troublesome œdema that followed in fractures of the lower limb.

Fractures of the neck of the femur.—It is perhaps here that modern treatment shows the most dramatic progress. Formerly it was the rule to apply weight-and-pulley extension, the limb being widely abducted. Where the general condition allowed of sufficient time, bony union took place with some shortening, but the patient was crippled mainly by the ankylosis of the hip-joint, following imperfect reduction and prolonged immobilisation, but many died of hypostatic pneumonia. In 1915 Cathcart wrote: "If there is no union at the end of 12 weeks, the patient must depend on bearing his weight upon ligaments." Statistics of 1922 show that barely 25 per cent. ever recovered good function. In young and active patients, surgeons were groping for operative measures which would prevent the disabling sequel of coxa vara and allow earlier movements, but they were content to drive into the neck of the femur from the trochanter nails or pegs that eventually became loose. In 1916 Hey Groves foreshadowed modern technique when in criticism of this he said: "What is required is a *massive* peg, capable of filling up the neck of the femur, supporting it at the correct angle with the shaft, and stimulating the formation of new bone for the natural process of repair." This requirement is now fulfilled by Smith-Petersen's pin, which originally was introduced into the neck of the femur by free exposure of the hip-joint, involving a big operation. More recently, however, Sven Johannson in Göteborg and M. Jerusalem in Vienna have independently worked out an extra-articular method. The pin is triradiate in cross-section, and is perforated so that it is thereby guided into position along a previously introduced wire, and driven home with a special hollow punch. This may, however, cause separation of the fragments, so they are reimpacted lightly by a few final taps from an "impaction punch." The various stages are verified by X ray examinations. The results are excellent, even in the aged, and the dangers minimised by using this method.

After 3 or 4 weeks the hip, knee, and ankle can be moved through a full range, and in 6 weeks the patient should be able to walk really well.

Conclusion

The treatment of fractures is an extremely large subject, and it has only been possible roughly to sketch the outlines of improvements evolved in the last 25 years. At present the best results appear to be generally obtainable from non-operative methods of safety and improved technique, which in many instances allow of natural function immediately. By these measures, our generation will benefit in a manner unknown to our predecessors, in reduction of the pain, sick-wastage, and lasting disability, that were previously endured by fractured humanity.

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A NEW FACTOR IN THE PRODUCTION AND CURE OF CERTAIN MACROCYTIC ANÆMIAS

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IT is well known that Marmite and similar autolysed yeast preparations are active curatively in tropical and other macrocytic anæmias in which there is little or no evidence of alteration in gastric secretion (Wills 1934, Vaughan and Hunter 1932). Further, such yeast extracts are active hæmopoietically in true pernicious anæmia after incubation with normal gastric juice (Strauss and Castle 1932, Groen 1935). Castle's theory postulates the formation of a liver hæmopoietic principle from the interaction of an extrinsic factor present in certain foodstuffs with an intrinsic factor present in normal human gastric juice. This liver principle has recently been isolated in a relatively pure form, known as anahæmin, by Dakin and West (1935, 1936). These workers point out that anahæmin, because of its method of preparation, can have no chemical similarity to the liver factor earlier isolated by Cohn, McMeekin, and Minot (1930), which these authors had shown also to be active curatively in pernicious anæmia. The nature of the yeast factor or factors is unknown.

In view of the fact that autolysed yeast is a potent source of Castle's extrinsic factor, it has been suggested that the principle in yeast active in the treatment of tropical macrocytic anæmia is identical with the extrinsic factor of pernicious anæmia, and that tropical macrocytic anæmia is therefore a deficiency state, due to a lack of this extrinsic factor in the diet (Wills 1934). The similarity of the blood picture in pernicious anæmia and in the tropical condition, and the fact that liver preparations are curative in both, lend support to this view. There are however certain difficulties in accepting this theory. If tropical macrocytic anæmia is due to a lack of "extrinsic factor" in the diet, then the final deficiency in the body must be in the liver principle. In classical pernicious anæmia, a deficiency in liver principle is associated not only with a macrocytic anæmia but also with an increased bilirubin content of the blood and an increased output of urobilin in the urine. In uncomplicated tropical macrocytic anæmia, although the anæmia is macrocytic, there is no increase of blood bilirubin or urinary urobilin (Wills and Mehta 1930). There is also no increase in blood bilirubin in the rhesus monkey suffering from nutritional anæmia. Further, it is a remarkable fact that no description of nervous lesions in the tropical condition has yet appeared.

With a view to investigating the problem of the nature of this nutritional macrocytic anæmia and of the hæmopoietic factor present in yeast, the animal experiments described below were undertaken.

In a previous paper (Wills and Stewart 1935) the production of a macrocytic anæmia in the rhesus monkey has been described and the reasons given for considering the anæmia as the animal counterpart of tropical macrocytic anæmia. The same methods were used in the present work. The activity of any extract was judged by the height of the reticulocyte response and the rise in the red cell count and the hæmoglobin percentage in a properly controlled animal. In view of the work of Miller and Rhoads (1933, 1935) on the failure of dogs, in which a macrocytic anæmia had been induced by dietetic means, to respond to parenterally administered liver extracts (the dogs were infected with Bartonella), the effect of intramuscular administration of the liver extract Campolon on our anæmia monkeys was first investigated. Campolon was used as it is known to be active curatively when given parenterally in the tropical macrocytic anæmia of man. Animals so treated responded well, though surprisingly large doses were often necessary to induce maximal responses.

Whilst this work was in progress, the liver factor curative in true pernicious anæmia became available in the highly purified form known as anahæmin. It was therefore desirable to determine whether anahæmin was also active curatively in the nutritional macrocytic anæmias of the rhesus monkey. It was found that a sample which was reported by Ungley (private communication) as active in two cases of pernicious anæmia was absolutely inactive, even in large doses, in the macrocytic anæmia of our experimental animals. Five monkeys were treated: two received 100 mg. daily for 10 days, during which time there was no reticulocyte response and the red cell counts of one animal fell and of the other remained stationary; after a further 6 days in which their condition remained unchanged both animals made excellent responses to campolon. The activity of the relatively crude liver extract, campolon, and the complete inactivity of the purified factor, anahæmin, both given parenterally, suggest that the causation of nutritional macrocytic anæmia of monkeys cannot be explained satisfactorily by assuming a simple lack of Castle's extrinsic factor in the diet and therefore of the liver principle in the body. It would appear that some other factor is involved.

The relation of the yeast factor to the vitamin-B_2 complex has also been investigated. This was rendered necessary by the recent work on the dual nature of this complex and the light labile character of the flavin component. It was first shown (unpublished) that in the rhesus monkey flavin was not the hæmopoietic factor, which agrees with the earlier work of Groen (1935) and Ashford et al. (1936), who showed that flavin was not the extrinsic factor in pernicious anæmia. The separation of the liver and yeast hæmopoietic factors from the "complement" or vitamin-B_6 component of the vitamin-B_2 complex was next attempted by applying the method of Dakin and West (1935) for separation of anahæmin from crude liver extracts. Acidulated yeast extracts which had been shown to be active in the cure of the monkey anæmia were first treated with calcium acetate and 70 per cent. alcohol, which removed considerable amounts of relatively inactive material. The monkey hæmopoietic factor was present in the filtrate. A certain amount of activity appeared to have been lost as the dose of filtrate necessary to produce a remission corresponded to larger amounts of dried yeast than those used in the preparation of a curative dose of the untreated extract. These yeast filtrates and also the liver extract, campolon, were then fractionated by use of Reinecke salt, which precipitates anahæmin. This method, in our hands, gave disappointing results. Thus, using yeast extracts in two monkey experiments the method led to

inactivation of both soluble and insoluble fractions. In a third experiment the soluble fraction, which should not contain anahæmin, was found to be active in the cure of the monkey anæmia. Fractionation of campolon in the same way led to complete inactivation. Similar uncertain results have been obtained by other workers attempting to separate anahæmin by the Reinecke method.

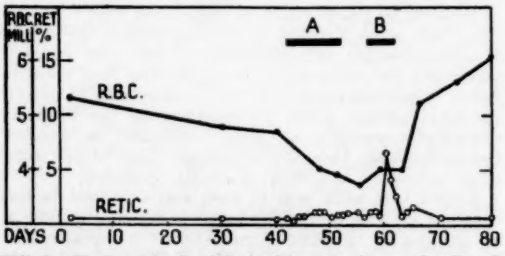

FIG. 1.—Monkey No. 7. Effect of treatment on red cell and reticulocyte counts.
A = anahæmin (1100 mg.). B = campolon (20 c.cm.).

Very good results were, however, obtained by using saturation with ammonium sulphate as a means of fractionation. Both yeast filtrates and campolon were then separated into fractions insoluble and soluble in saturated ammonium sulphate. The two fractions from campolon were tested on both men and monkeys, and those from yeast on monkeys only. The insoluble fraction from campolon, which would contain any anahæmin present, induced an immediate remission in two untreated controlled cases of pernicious anæmia, whereas this fraction was completely inactive in monkeys. The same monkeys subsequently responded to similar parenteral administration of the soluble fraction. Similarly the insoluble fraction from the yeast extract, which should contain any anahæmin-like bodies present in yeast, was completely inactive in anæmic monkeys, who responded to treatment with the soluble fraction: both fractions were in this case given by mouth. The soluble yeast fraction, unlike the soluble fraction from campolon, was inactive when given parenterally to one monkey; this animal however responded when enormous doses of new anahæmin, 200 mg. daily for 10 days, were given immediately after the yeast injections.

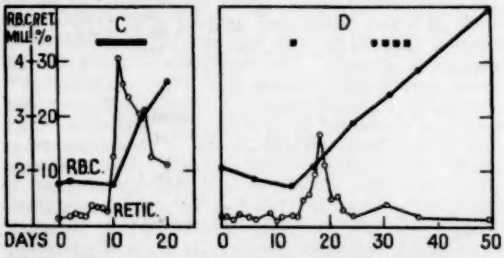

FIG. 2.—Effect of campolon extract, insoluble in ammonium sulphate, on two patients.
C = $(NH_4)_2SO_4$-insoluble extract from 102 c.cm. campolon.
D = $(NH_4)_2SO_4$-insoluble extract from 20 c.cm. campolon (each black square represents 4 c.cm.).

CASE REPORTS: HUMAN AND MONKEY

A few illustrative cases are described, a full record will appear elsewhere.

For brevity the following *abbreviations* are used: Red blood-cells, R.B.C.; the figures express millions per c.mm. Hæmoglobin, Hb.; figures express percentages, 100 per cent. being equivalent to 14 g. hæmoglobin. As the red cells of the monkey are smaller than those of man, the uncorrected colour-index for healthy animals is generally about 0·69, corrected for the monkey standard of 6 million red cells and 14 g. hæmoglobin the colour-index is approximately 0·84. In the text days are reckoned from the commencement of any one treatment.

ANAHÆMIN AND CAMPOLON

MONKEY No. 7 (Fig. 1) was rendered anæmic by feeding deficient diet, on which he remained throughout experiment. Treated with campolon in February, 1936: made a good recovery. April: R.B.C. 6·495, Hb. 90 per cent. Relapsed July 13th, R.B.C. 4·530, Hb. 64 per cent. Anahæmin parenterally 100 mg. daily for 10 days. 7th day: R.B.C. 4·055, Hb. 55 per cent. 14th day: R.B.C. 3·970, Hb. 58 per cent. Reticulocytes never above 1 per cent. July 29th: campolon parenterally, 4 c.cm. daily for 5 days. 3rd day: R.B.C. 4·260, Hb. 59 per cent. 5th day: reticulocytes 5·7 per cent. 10th day: R.B.C. 4·975, Hb. 70 per cent. 16th day: R.B.C. 5·590, Hb. 75 per cent. 24th day: R.B.C. 6·135, Hb. 82 per cent. No response to anahæmin; good sustained response to campolon. Four other monkeys failed to respond to treatment with anahæmin, but later responded to campolon or other active extracts.

CAMPOLON FRACTIONATED WITH AMMONIUM SULPHATE: INSOLUBLE AND SOLUBLE FRACTIONS

MAN aged 64 (Fig. 2). Uncomplicated pernicious anæmia with signs of subacute combined degeneration. Histamine test-meal: complete achlorhydria. Van den Bergh, indirect reaction: 4 units. Nov. 10th, 1936:

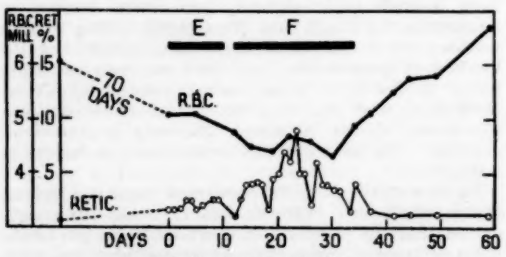

FIG. 3.—Monkey No. 50.
E = $(NH_4)_2SO_4$-insoluble extract from 40 c.cm. campolon.
F = $(NH_4)_2SO_4$-soluble extract from 116 c.cm. campolon.

R.B.C. 1·715, Hb. 48·5 per cent. Nov. 16th: R.B.C. 1·745, Hb. 51 per cent. Reticulocytes: highest value 1·3 per cent. Nov. 17th: started treatment with insoluble fraction: the precipitate derived from 12 c.cm. original campolon given daily for 7 days and that from 6 c.cm. daily for 3 days. Marked clinical improvement after 1st day. 6th day: reticulocytes reached maximum value of 30 per cent. 10th day: R.B.C. 2·933, Hb. 58 per cent. Dose stopped. 15th day: R.B.C. 3·523, Hb. 72 per cent. The reticulocyte peak was higher than the expected value and the red cells increased at the rate of 100,000 a day. Excellent response to treatment with ammonium-sulphate-insoluble fraction of campolon.

WOMAN aged 59 (Fig. 2). Uncomplicated pernicious anæmia with signs of subacute combined degeneration. Histamine test-meal: complete achlorhydria. Van den Bergh, indirect reaction: 2 units. Oct. 29th, 1936: R.B.C. 1·980, Hb. 50 per cent. Nov. 2nd: R.B.C. 1·790, Hb. 51 per cent. Nov. 9th: R.B.C. 1·700, Hb. 50 per cent. Reticulocytes: highest value 1·8 per cent. Given a single dose of the insoluble fraction, the precipitate from 4 c.cm. of campolon. 5th day: R.B.C. 2·025, Hb. 58 per cent., reticulocytes 10·0 per cent. 6th day: reticulocytes 18 per cent. 8th day: R.B.C. 2·193, Hb. 60 per cent. A good reticulocyte response and a rise of 0·493 million red cells in 8 days, which though not maximal is a good rise after a single dose, derived from only 4 c.cm. of original campolon. Four more similar doses were given and on the 22nd day from the original dose the red cells had risen to 3·915, Hb. 72 per cent. This

represents a rise of 2·2 millions in 22 days. Excellent response to treatment with ammonium-sulphate-insoluble fraction of campolon.

MONKEY No. 50 (Fig. 3). On June 11th, 1936, diet commenced: R.B.C. 6·610, Hb. 96 per cent. Oct. 21st: R.B.C. 3·950, Hb. 59 per cent., started insoluble fraction parenterally, amount derived from 4 c.cm. untreated campolon daily for 10 days. Reticulocytes: maximum value 2·4 per cent. 10th day: R.B.C. 3·665, Hb. 56 per

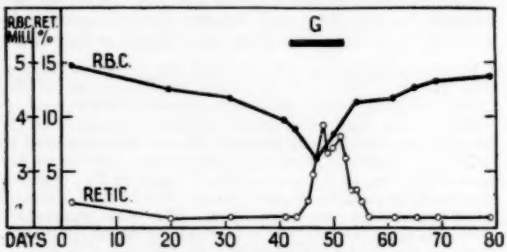

FIG. 4.—Monkey No. 7.
G = $(NH_4)_2SO_4$-soluble extract from 80 c.cm. campolon.

cent. Three days later, as no response, started treatment with soluble fraction, for first 7 days daily dose derived from 4 c.cm. untreated campolon; dose then increased to yield from 8 c.cm. campolon for 10 days. 4th day: R.B.C. 3·465, Hb. 57 per cent., reticulocytes 3·6 per cent. 8th day: reticulocytes 4·0 per cent. but no rise in count, so dose increased. 11th day: R.B.C. 3·610, Hb. 50 per cent., reticulocytes 8·3 per cent. Reticulocytes remained up for further 8 days. 22nd day: R.B.C. 3·790, Hb. 58 per cent. 27th day: R.B.C. 4·420, Hb. 67 per cent. The plateau type of reticulocyte response and slow rise in R.B.C. count suggest that the dose was not optimal. No response to treatment with ammonium-sulphate-insoluble fraction of campolon: suboptimal response with soluble fraction.

MONKEY No. 7 (Fig. 4). On Oct. 16th, 1936, had been on diet for many months and used experimentally several times before. R.B.C. 4·960, Hb. 70 per cent. Nov. 24th: R.B.C. 3·900, Hb. 57 per cent., reticulocytes 0·3 per cent. Nov. 26th: R.B.C. 3·760, Hb. 55 per cent., reticulocytes 0·2 per cent. Started treatment with soluble fraction equivalent to 8 c.cm. original campolon. 5th day: R.B.C. 3·230, Hb. 48 per cent., reticulocytes 4·7 per cent. 6th day: reticulocytes 9·0 per cent. and values stayed up till 10th day. Dec. 3rd: R.B.C. 3·670, Hb. 50 per cent. 12th day: R.B.C. 4·270, Hb. 60 per cent. 19th day: R.B.C. 4·44, Hb. 67 per cent., very few reticulocytes. Good reticulocyte response and rapid initial rise in red cell count after treatment with ammonium-sulphate-soluble fraction of campolon by mouth.

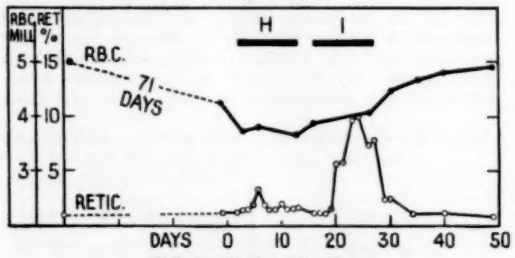

FIG. 5.—Monkey No. 52.
H = $(NH_4)_2SO_4$-insoluble extract from 600 g. yeast.
I = $(NH_4)_2SO_4$-soluble extract from 600 g. yeast.

ACIDULATED YEAST EXTRACT FRACTIONATED WITH AMMONIUM SULPHATE AFTER TREATMENT WITH (*a*) CALCIUM ACETATE AND 70 PER CENT. ALCOHOL; (*b*) 80 PER CENT. ALCOHOL: INSOLUBLE AND SOLUBLE FRACTIONS

Oral administration of (a)

MONKEY No. 52 (Fig. 5). Started deficient diet on June 12th, 1936: R.B.C. 4·675, Hb. 70 per cent. Oct. 20th: R.B.C. 3·646, Hb. 54 per cent. Started treatment with insoluble fraction, dose derived from 60 g. dried yeast given daily by mouth for 10 days. No response. Maximal reticulocyte value 2·7 per cent. 10th day: R.B.C. 3·610, Hb. 57 per cent. Three days later, as the condition was unchanged, treatment was started with similar doses of the soluble fraction. 3rd day: R.B.C. 3·610, Hb. 57 per cent., reticulocytes 1·6 per cent. 6th and 7th days: reticulocytes 9·1 per cent. and 9·4 per cent. respectively. 10th day: R.B.C. 3·975, Hb. 61 per cent., reticulocytes 7·4 per cent. 17th day: R.B.C. 4·553, Hb. 67 per cent., reticulocytes 0·2 per cent. 23rd day: R.B.C. 4·745, Hb. 75 per cent. No response to the insoluble fraction. A good reticulocyte response to soluble fraction and a steady but rather slow rise in red cells.

Parenteral administration of soluble fraction from (b) followed by anahæmin

MONKEY No. 52 (Fig. 6) had responded to the ammonium-sulphate-soluble-fraction of our yeast extract, so after being run out again was selected for a trial of this fraction by the parenteral route. Dec. 8th, 1936: R.B.C. 3·825, Hb. 59 per cent., reticulocytes 0·2 per cent. Dec. 11th: R.B.C. 3·785, Hb. 60 per cent., reticulocytes 1·6 per cent. Injections started, daily dose equivalent to 50 g. dry yeast for 10 days. 5th day: R.B.C. 3·540, Hb. 57 per cent., reticulocytes 1·0 per cent. 8th day: R.B.C. 3·260, Hb. 45 per cent., reticulocytes 2·6 per cent. 11th day: R.B.C. 2·905, Hb. 40 per cent., reticulocytes 1·0 per cent. No response and as animal was going down rapidly treatment with anahæmin was started, 200 mg. daily for 10 days. 7th day: R.B.C. 3·175, Hb. 44 per cent., reti-

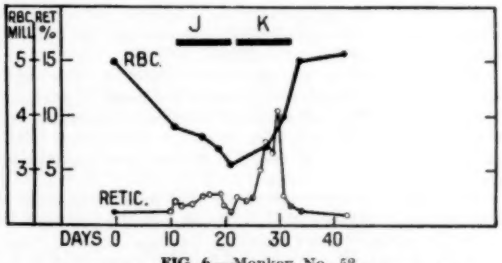

FIG. 6.—Monkey No. 52.
J = $(NH_4)_2SO_4$-soluble extract from 500 g. yeast.
K = anahæmin 20 c.cm.

culocytes 4·5 per cent. Reticulocyte counts remained high till 10th day, when value reached 10·3 per cent. 11th day: R.B.C. 3·715, Hb. 52 per cent., reticulocytes 2·3 per cent. 15th day: R.B.C. 4·895, Hb. 68 per cent., reticulocytes 0·5 per cent. No response to parenteral administration of soluble fraction of acidulated yeast alone (active by mouth) but excellent response when enormous doses of new anahæmin were given immediately after previous treatment.

DISCUSSION

The work described above suggests that at least two hæmopoietic factors are present in all those extracts (e.g., liver, autolysed yeast extracts, and wheat germ) which are active both in true pernicious anæmia in man—some only after incubation with normal gastric juice—and in the nutritional macrocytic anæmia of the monkey. It is only when the principles concerned are obtained in a relatively pure form that their different action becomes clear. It is not suggested that monkeys do not require the liver principle contained in anahæmin, but only that the anæmia under discussion is not produced by a simple lack of this factor, and cannot therefore be due solely to absence of Castle's extrinsic factor in the diet as originally suggested. This monkey anæmia appears to be due, in part at least, to the lack of some other factor at present unidentified. It seems possible, however, that the two factors are

concerned both in the monkey anæmia and in pernicious anæmia, and there is some evidence that this view is correct. For example, the more sustained response in the monkey to the crude extracts in comparison with the response to the more highly purified fractions, even when these are given in doses derived from far larger amounts of the parent substance (yeast or liver) than those used in the preparation of the cruder extracts, points in this direction. The fact that one monkey responded well to very large doses of anahæmin when given immediately after the parenteral injection of the monkey fraction from yeast also suggests that this principle is necessary for normal hæmopoiesis in the monkey. The crude extracts may well contain both factors; campolon certainly does. If then there is in the monkey suffering from macrocytic nutritional anæmia a deficiency of both factors, but a relatively greater lack of the new factor, then the administration of this latter may activate the small supply of the liver principle still available in the body. The liver principle thus activated will cause an initial rise in the red cell count, which however will not be sustained when the small supply of the liver principle is exhausted. Accepting this explanation of the action of the new factor as correct, then there might well be exceptional cases of pernicious anæmia, in which there is a deficiency, not only in the liver principle contained in anahæmin but also in the new hæmopoietic factor. Such cases would either not respond to anahæmin or make a poor unsustained response, but would respond to the cruder preparations such as campolon.

Further work is necessary to elucidate this and numerous other related problems, the most important being the relation of tropical macrocytic anæmia to the animal condition. A trial of treatment with anahæmin in cases of tropical macrocytic anæmia is now being made in India.

The nature of this new factor is at present unknown but is being investigated. The possibility of identifying it with the vitamin-B_6 fraction of the vitamin-B_2 complex is suggested by the facts that it is present in the more soluble fractions of yeast, marmite, liver, and wheat-germ extracts, and that it shows similar behaviour to heat, alcohol, and various chemical reagents. It is also more nearly allied chemically to the hæmopoietic substance earlier isolated by Cohn, McMeekin, and Minot (1930) than to anahæmin or hæmopoietin.

CONCLUSIONS AND SUMMARY

Two factors have been separated from the liver extract campolon, one soluble and one insoluble in saturated ammonium sulphate.

Given parenterally, the soluble fraction is curative in the nutritional macrocytic anæmia of rhesus monkeys. The insoluble fraction, which contains the anahæmin present in campolon, is inactive in the monkey anæmia—as are also the commercial preparations of anahæmin—but is curative in pernicious anæmia.

Similar fractionation of the alcohol-soluble fraction of acidulated aqueous yeast extract yields two fractions, of which (when given by mouth) the insoluble is inactive and the soluble active in the monkey anæmia. This soluble fraction was inactive in the treatment of one monkey when given parenterally.*

There is some evidence that both factors are necessary for hæmopoiesis in man and rhesus monkeys, but that in the production and cure of the nutritional anæmia of the monkey it is the soluble fraction that is mainly concerned. Its action in tropical macrocytic anæmia is being investigated.

The two factors must be present in those extracts of liver, yeast, and wheat germ that are active either alone or after mixture with gastric juice in both the monkey and pernicious anæmia.

The possible relationship of the new factor to the vitamin-B_2 complex and to the factor previously isolated by Cohn, McMeekin, and Minot is discussed.

It is a pleasure to acknowledge the generous help of Miss Hariette Chick, D.Sc., and her colleagues at the Lister Institute, who gave us supplies of flavin and of certain yeast and wheat-germ extracts standardised in terms of the vitamin-B_6 factor. We are indebted also to Dr. C. C. Ungley of Newcastle-upon-Tyne for testing the anahæmin used in the present work, and to Dr. Dorothy Hare and Dr. Jenner Hoskin of the Royal Free Hospital for permission to treat their cases. The yeast from which the extracts were made was very kindly given us by Messrs. Watney, Combe and Reid of the Stag Brewery, S.W.1.

A detailed report of this work will appear elsewhere. The expenses were paid by a grant to one of us (L. W.) from the Lady Tata Memorial Trust.

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TUBERCULOUS LESIONS IN ASSOCIATION WITH GENITO-URINARY TUBERCULOSIS

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It is recognised that urinary tuberculosis is secondary to a source of tuberculosis elsewhere in the body; that the prognosis depends greatly on the state of the preceding focus; and that sanatorium treatment after operation is of value in improving the prognosis (Joly 1935). It seemed to me that an investigation of the types of tuberculous lesion accompanying genito-urinary tuberculosis and their effect on the disease would be of interest and would tend to confirm the hæmatogenous nature of genito-urinary infections. The following series was there-

TABLE I.—*Genito-urinary and Genital Tuberculosis Classified According to Age and Sex*

Age.	Genito-urinary.		Epid.-orch. alone.	Age.	Genito-urinary.		Epid.-orch. alone.
	M.	F.			M.	F.	
1–10	2	1	—	41–50	4	3	1
11–20	3	1	2	51–60	2	1	—
21–30	8	2	—				
31–40	9	5	3	Total	28	13	6

M. = male. F. = female. Epid.-orch. = Epididymo-orchitis.

* Since writing the above a monkey has responded to the parenteral administration of this soluble fraction from yeast.

fore investigated of unselected cases admitted to the Essex county council sanatorium during 1931–36, either from general hospitals or from tuberculosis dispensaries, with the exception of 6 patients who developed genito-urinary tuberculosis while under treatment at the sanatorium for bone or joint lesions. The total number was 47, and they are set out according to their age and sex in Table I. The number of cases with tuberculous lesions elsewhere was 29, or 62 per cent. of the total. The incidence and nature of the lesions are set out in Table II.

TABLE II.—*Distribution of other Tuberculous Lesions in Genito-urinary Tuberculosis (46 Cases)*

Site and type of lesion.	No. of cases.	Site and type of lesion.	No. of cases.
No other tuberculous lesion	13	Both pulmonary and skeletal tuberculosis	11
Primary lung lesions or calcified hilum glands	3	Pulmonary tuberculosis and lupus ..	1
Calcifications in the spleen	2	Pulmonary tuberculosis and tuberculous bursitis	1
Tuberculosis of lung or pleura	7	Skeletal tuberculosis and subcutaneous tuberculous abscesses	1
Skeletal tuberculosis..	8		

In estimating the effect of these other lesions on the severity of the disease, the time that has elapsed since discharge has generally been too short for opinion to be of value. The factors that have been used for this purpose therefore are the mortality-rate of patients in each group of extraneous lesions, the present condition in each group of the patients who are still alive, and the average duration of the disease of these patients. These particulars are given in brief in Table III.

TABLE III.—*Present Condition*

Distribution of lesions.	No. of cases.	Alive.	Average duration (yrs.).	Present condition.		Still under treatment.	No recent information.	T.B. in urine.	No T.B. in urine.	Dead.
				Satis.	Not satis.					
Genito-urinary tuberculosis alone	18	16	6	10	5	1	0	5	11	2
With lung tuberculosis	7	5	2–5	3	1	1	0	2	3	2
With skeletal tuberculosis	8	7	4–5	1	3	2	1	5	1	1
With lung and skeletal tuberculosis	11	7	2–5	2	2	2	1	3	3	4
With lung and other tuberculous lesions	2	1	5	1	0	0	0	0	1	1
With skeletal and and other tuberculous lesions ..	1	1	3	1	0	0	0	0	1	0
Total ..	47	37	—	18	11	6	2	15	20	10

Present condition satis.= Health good and no marked symptoms.
Present condition not satis.= Health poor *or* marked symptoms present.

WITHOUT TUBERCULOUS LESIONS ELSEWHERE

In the series 18 cases had no other discoverable tuberculous lesions than the genito-urinary, except in 3 cases with evidence of primary infection, and in 2 cases with calcified miliary foci in the spleen. The presence of miliary splenic foci may be regarded as evidence that a bacillæmia had previously occurred. Miliary tubercles may be observed by radiography to disappear from the lungs of children without leaving evidence in the form of calcifications, and a bacillæmia may therefore have occurred also in other cases of this series without leaving any traces that could be detected radiographically. In this group of 18 cases, however, the resistance of the patient was good and the disease whatever its method of dissemination, became fixed in one system, genital or renal, or even in one focus. It thus became amenable to removal by excision. In examining this group of cases therefore it would be expected that operative treatment had been performed in the majority and that the results were good. This is confirmed by the findings.

Of the 18 cases, 16 are alive after an average period of more than six years from the date of onset of symptoms; 2 of these were of genital tuberculosis only, treated by orchidectomy, while the remaining 14 cases had renal tuberculosis, 10 of which had been treated by nephrectomy. Of the 2 patients who died, 1 had been treated by nephrectomy 15 years previously; the other was a child who had had no operative treatment.

The health of the majority of the survivors at the present time is satisfactory.

WITH TUBERCULOSIS OF THE LUNG OR PLEURA

Tuberculous pulmonary lesions were found in 20 cases of the 47 (42·5 per cent.), but as the earlier cases in the series did not have routine chest radiograms, this figure is probably an under-statement. It may be compared with the figure, quoted by Reisner (1934), who in a series of 69 cases of genito-urinary tuberculosis in New York found pulmonary lesions in 44 (66 per cent.). Reisner has made observations on the types of lung lesions occurring with extra-pulmonary tuberculosis and has classified them into two main groups. In the first and larger group the disease is bilateral, is distributed in an apico-caudate direction, is frequently non-ulcerative, and causes no abnormal physical signs. The lesions of the second group are those characteristic of phthisis. In the first group, in Reisner's opinion, the disease is hæmatogenous in origin. The findings in the present series tend to agree with Reisner's and are given in Table IV., so far as is possible,

TABLE IV.—*Classification of the Tuberculous Lung Lesions*

Type of lesion.	No. of cases.	Alive.	Dead.
Bilateral apical lesions, interstitial or fibrotic; activity nil or slight ..	8	7	1
Unilateral apical scarring	1	1	0
Widespread bilateral apico-caudate lesions	3	0	3
Bilateral acute disseminated disease of miliary type	2	0	2
Fibrocaseous lesions of phthisis ..	3	3	0
Pleural effusions	3	2	1 (child)

according to his classification. The mortality with each type of lung lesion is also noted. From this Table it will be seen that the apical lesions, which are usually of a low degree of activity, make little difference to the severity of the disease; that the fibrocaseous lesions of phthisis have not been of grave prognosis; and that the bilateral apico-caudate lesions have proved the most dangerous. The latter are usually an advanced stage of the bilateral apical lesions, but an advance of the disease of this sort is not likely when once the apical lesions have become fibrotic. The 2 cases of miliary tuberculosis mentioned in this series were ones in which the disease was discovered radiographically. There is no doubt that there may have been other cases also in the series that died of miliary tuberculosis.

A consideration of the effect of tuberculous lung lesions on renal disease in this series is complicated

by the presence of additional tuberculous lesions in the skeleton or other tissues in 13 of the cases. These additional lesions increase the gravity of the disease. Thus 7 cases had tuberculous lesions in the lungs, of whom 5 are alive. Of the 13 patients who had skeletal and other lesions in addition to lung lesions, 5 have died; the average duration of the disease of the 8 cases alive is only 2½ years, but the fact that some of these are making favourable progress is an indication that with sanatorium treatment even cases with multiple lesions may occasionally do well, provided operation has been practicable. It will be seen, however, that the resistance of the patients in this group with lung lesions is lower than in the previous group in which there were no tuberculous lesions outside the genito-urinary tract. It will be seen also that when there are multiple tuberculous lesions, the lung lesions tend to be of the more serious type.

WITH TUBERCULOSIS OF THE SKELETAL SYSTEM

There were tuberculous lesions in the skeleton in 20 cases (42·5 per cent.). In 8 the lesions were quiescent and in 12 active. The quiescence or activity of the lesions, however, was found to be less important than their accompaniment by pulmonary lesions. Thus 5 of the 8 cases with quiescent skeletal lesions are alive and 3 have died, and 10 of the patients who had active skeletal disease are alive and 2 have died. On the other hand, when the groups of skeletal lesions are considered that occurred with and without pulmonary disease it is found that the presence of pulmonary disease is significant. There were 9 cases with no pulmonary involvement: of these 8 are alive and 1 has died; there were 11 cases of skeletal disease with pulmonary involvement, of whom 7 are alive and 4 have died.

In every case the skeletal lesion preceded the lesion in the genito-urinary tract, but it is not possible to ascertain whether the latter was the result of invasion of tubercle bacilli from the skeletal lesion into the blood stream, or whether there had been an infection from another source. The situations of the skeletal lesions were as follows: in 8 cases the lesions were in the spine, in 5 in the hip, in 2 in the sacro-iliac joint, and in single cases in the shoulder, sternum, knee, rib, and wrist. Several patients had multiple skeletal lesions. The variety of the sites of skeletal disease and the incidence of genito-urinary lesions in this group indicate that these lesions were of hæmatogenous origin.

URINARY TUBERCULOSIS WITH TUBERCULOSIS OF THE LYMPHATIC SYSTEM

In childhood the lymphatic system forms a barrier to invasions of the blood stream by tubercle bacilli; genito-urinary tuberculosis is therefore fortunately uncommon among children. It becomes more common in later life, when the lymphatic tissues of the body begin to atrophy. It is therefore not surprising in this series to find very little evidence of tuberculous involvement of the lymphatics. In 3 of the children there was evidence of primary infection with calcified hilum glands. In 3 cases also calcified tuberculous glands were present in the abdomen, and in 1 case there were healed cervical glands. In no patient was active glandular tuberculosis present.

TUBERCULOUS EPIDIDYMO-ORCHITIS WITH LESIONS OUTSIDE THE GENITAL OR URINARY TRACTS

In this series of cases it is worth noting that genital tuberculous lesions, occurring without renal tuberculosis, were associated with hæmatogenous tuberculous lesions outside the genital or urinary tracts. In 20 cases of epididymo-orchitis the relationship with renal disease was as follows:—

(1) Cases in which no renal disease has developed	6
(2) Cases in which epididymo-orchitis preceded renal disease	8
(3) Cases in which epididymo-orchitis followed renal disease	3
(4) Case in which the onset of epididymo-orchitis and renal disease was concomitant	1
(5) Cases in which the history of precedence was doubtful	2

In 15 cases, therefore, detectable renal disease did not precede epididymo-orchitis, and infection of the epididymis could not have occurred by lymphatic spread from the kidney. Of these 15 cases 11 were preceded or accompanied by lesions of hæmatogenous origin outside the genital or renal tracts. From this it may be inferred that genital tuberculosis, like renal tuberculosis, is part of a hæmatogenous infection and is not a primary manifestation of tuberculous disease. The incidence of genital with renal tuberculosis does not seem to have increased the severity of the disease in this series.

I wish to express my gratitude to Dr. W. A. Bullough, medical officer of health to the Essex County Council, and to Mr. R. Reid, consulting surgeon to the sanatorium, for the assistance they have given me with this article, and to the tuberculosis officers of the Essex County Council for the records that they have provided of the present condition of the cases in the series.

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GENITO-URINARY TUBERCULOSIS

WITH A REVIEW OF 100 CASES

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THE term genito-urinary tuberculosis comprises tuberculous disease of the kidneys, ureters, bladder, prostate, vesicles, testes, and epididymes in the male, and of the uterus, ovaries, Fallopian tubes, vagina, and vulva in the female. The condition is never primary, but is secondary to a tuberculous lesion elsewhere, which may be apparently quiescent. This lesion is either primary (e.g., in the lungs) or secondary (e.g., in bones). Harris (1928–29) found that of 110 cases of tuberculosis of bones a quarter had tubercle bacilli in the urine. And Medlar (1928) states that tuberculous bacilluria never occurs without demonstrable lesions in the kidneys, though these are often only microscopic in size. Secondary infection by pyogenic organisms is common, and tuberculosis often supervenes on chronic pyogenic infections.

The genito-urinary disease may be part of a generalised miliary tuberculosis (tuberculous septicæmia) or (as in the 100 cases on which this paper is based) it may be localised to one or more organs.

Local Pathology

Kidney.—Renal tuberculosis is generally unilateral, later involving the ureter and bladder, but the second

kidney may become infected through the blood stream, through the peri-ureteral lymphatics, or by reflux of urine from the bladder. Grey tubercles form usually in the apex of the pyramids; but sometimes around the glomeruli in the cortex, and they gradually coalesce to form a caseous mass, which either calcifies or breaks down to form an abscess. In either case the result may be involvement of the whole kidney, or a localised calcified mass, or an abscess. Where the kidney is converted into a large tuberculous abscess, the perinephric fat is usually infected. More rarely the kidney becomes fibrosed and contracted.

Ureter.—In serious cases the ureter is converted into a rigid tube with thick walls, the mucous coat being destroyed over large areas.

The *bladder* is always infected, either from the kidneys, from the prostate and vesicles, or (in the female) from the urethra. In the early stages of infection from the kidney there may be only a few grey tubercles situated around one or both ureteric orifices, with some associated œdema and redness; later there is ulceration and the ureteric orifice becomes rigid (golf-hole type). When the bladder is infected from the prostate and vesicles or from the urethra the trigone is first affected. In tuberculous disease of the bladder the mucous membrane soon becomes acutely inflamed; cystoscopy is difficult, and the bladder capacity is greatly reduced. The ulcers are characteristic, being small and round, with undermined edges, and tend to become confluent; the base is sloughy. Secondary pyogenic infection is common.

In my own series tuberculosis has rarely spread from bladder to genital organs, but often, in the male, in the opposite direction.

MALE ORGANS

Epididymis.—The tuberculous infection begins in either globus major or minor. It is usually unilateral and due to spread from the prostate, but it can be hæmatogenous. The epididymis may become converted into a caseous mass; or the disease may be limited to a nodule, which becomes calcified. At first there is an associated hydrocele—more rarely a hæmatocele. Suppuration is common, with involvement of the testes and scrotum, leading to sinus formation with secondary infection.

The *testis* is involved by spread from the epididymis.

The *vas deferens* is infected either from the prostate and vesicles, or from the epididymis. It may become enormously thickened.

Tuberculosis in the *prostate* comes from the epididymis (via the vas deferens), from the blood stream, or, more rarely, from the bladder as a result of severe ulceration involving the internal urinary meatus. The lesion is usually caseous, but occasionally it is sclerotic, producing contraction of the prostatic urethra, with retention of urine. In favourable cases calcification occurs. Abscess formation is not uncommon; the pus may track alongside the rectum into the perineum, producing an ischiorectal abscess, or may perforate the bowel and cause a urinary fistula. More often it bursts into the bladder.

Seminal vesicles.—Vesiculitis is due to spread from the epididymis or prostate, and the outline of the vesicles can be seen on cystoscopy.

FEMALE ORGANS

Norris (1933) states that tubercle bacilli may infect the female genitalia (1) through the blood stream—the commonest route; (2) by direct extension from a neighbouring focus, such as the peritoneum or intestinal or urinary tracts; (3) from a nearby focus, via the lymphatics; or, rarely, (4) by direct infection, as by tubercle bacilli in the semen, with slight trauma, or by infected instruments.

In the *external genitalia* the disease may be either ulcerative or hypertrophic, the former being the commoner. The hypertrophic often becomes ulcerative, and tubercle bacilli are more easily found in the ulcerative type.

Vulva.—Vestibular tuberculosis is usually of the small multiple ulcer variety; but a papilliferous or hypertrophic condition is also seen.

Bartholin's glands are infected occasionally, without any other lesion of the vulva.

In the *vagina* tuberculosis is rare; the usual form consists of small multiple ulcers, and it is usually due to spread from the uterus.

The *cervix* is also rarely affected. There may be a shallow indolent ulcer, with thin undermined edges and irregular base, or the condition may resemble carcinoma (hypertrophic form).

Uterus.—The body of the uterus is fairly often the site of tuberculous disease, manifested either as endometritis or perimetritis, the first being the commoner. There is often a pre-existing tuberculous salpingitis, and the endometrium is involved around the tubal openings. The miliary type is more often met than the ulcerative or the caseous.

Fallopian tubes.—Chronic inflammation, due to puerperal sepsis or gonorrhœa, is an important predisposing factor. In more than three-quarters of Norris's cases the primary lesion was pulmonary.

The *ovaries* are resistant to tuberculous disease; and when present it has usually spread from the tubes or from the peritoneum. The natural process of arrest is by fibrosis and calcification.

Diagnosis

Of the 100 cases under review, which came from London, the Home Counties, and Cornwall, 7 had a history of pleurisy and 1 of tuberculous enteritis. Otherwise no tuberculous history was given. In only 17 could any clinical or radiological evidence of extragenital tuberculosis be discovered, the distribution being as follows: lungs, 4; glands of neck, 3; spine, 2; sacro-iliac joints, 1; hip, 4; carpus, 1; tarsus, 1; peritoneum, 1.

In *renal disease* dysuria was the first symptom in 37 of the 49 cases; in the other 12 it was symptomless hæmaturia. Cystoscopy was not done on patients who had to pass urine more than once an hour, nor in cases with strangury. The diagnosis was established by finding tubercle bacilli, either by ureteric catheterisation or by sedimentation of a 24 hours' specimen of urine, with inoculation of a guinea-pig if necessary. Of 20 cases investigated pathologically however, 14 (70 per cent.) showed no tubercle bacilli at all, the organisms in the other 6 being all of human, as opposed to bovine, type.

Pyelography, intravenous and ascending, showed deficient filling of the pelvis and calyces, the latter being "clubbed"; while intravenous pyelography had the additional advantage that the rate of excretion of the dye gave an idea of the severity of the lesion.

Male genital tuberculosis.—The commonest first indication of epididymitis is a painless enlargement. More rarely, an acute form is seen with pain and an associated hydrocele. The nodular feel of the epididymis, and the fact that testicular sensation is retained, help to differentiate tuberculosis from syphilis. In the acute variety aspiration of the

hydrocele permits of more accurate palpation. Also, rectal examination will often reveal nodules in the prostate.

In tuberculous prostatitis there may be no symptoms other than occasional dysuria, with slight discharge, which "gums" the external urinary meatus. Examination of the urine reveals shreds and pus, and tubercle bacilli. On the other hand a perineal abscess is occasionally the first symptom; or, more rarely, hæmaturia. In tuberculous epididymitis, rectal examination more often than not reveals prostatic nodules.

Female genital tuberculosis may be very difficult to diagnose. Vulvitis, infection of Bartholin's gland, and cervicitis cannot be reckoned tuberculous unless tubercle bacilli are found; tuberculous disease of the cervix may simulate carcinoma, while tuberculous vulvitis may simulate syphilis. The discharge from a tuberculous endometritis is usually less offensive and hæmorrhagic than that of malignant disease, but the presence of tubercle bacilli in the endometrium is the only sure method of diagnosis, and it necessitates curettage. Tuberculous disease of the Fallopian tubes may be suspected if the patient is suffering from tuberculous disease elsewhere, but otherwise it can only be made at operation.

The 100 Cases

Of the 100 cases here described all but 8 were seen and treated at St. Michael's Hospital, Hayle, Cornwall. Some had already been operated on; some were sent for observation and treatment; while some were sent because they were inoperable but improved to such an extent that operation became feasible. The youngest was 14 years of age (female) and the oldest 60 (male), the average being 25½ years. There were 52 males and 48 females. The history sheets which came with most of the patients contained a note of the home conditions which were described as good in 24 cases, fair in 25, and bad in 51. These unsatisfactory conditions made it difficult to secure even moderately suitable after-care.

The *condition on admission* may be briefly summarised as follows:—

Febrile	4	General condition—	
Sinuses	17	Fair	64
Operation scars	24	Bad	36

In considering the results the following classification was adopted:—

Arrested or "cured" means that there were no signs or symptoms and the urine was clear.

Relieved means that weight had increased, signs and symptoms were less pronounced, there was no fever or pain, and the urine contained no more than a trace of pus.

The following Table shows the position at the end of the five years. It will be noted that there were 9 deaths amongst the renal cases; in the 4 cases not operated on the condition was bilateral. The cause of death was uræmia in 3 cases and generalised tuberculosis in the remaining 6. Of the 6 males with genital tuberculosis who died 4 developed bilateral renal disease with gross cystitis and uræmia; the other 2 died of pulmonary tuberculosis. None of the 4 patients with tuberculosis of the prostate developed epididymitis, but 1 had severe cystitis, and was worse when last examined than on admission.

Treatment

Genito-urinary tuberculosis is treated on the same principles as tuberculosis elsewhere. Good hygiene, a generous diet (unless there is fever), fresh air and sunlight, and a cheerful environment are necessary. Febrile patients are kept in bed, and so are those with extensive sinuses, for a sinus will never heal if the part affected is not kept at rest. Afebrile patients are allowed moderate exercise. In renal tuberculosis plenty of liquids (e.g., barley water, Imperial drink, water, tea, and milk) are given, for they alleviate dysuria. Extra milk has been found very helpful.

Results after Five Years or More

—	Arrested or "cured."		Relieved.		Worse.		Deaths.		Untraced.		Totals.
	Op.	Non-op.	Op.	Non-op.	Op.	Non-op.	Op.	Non-op.	Op.	Non-op.	
Renal ..	15	2	4	2	2	4	5	4	5	6	49
Testes and epididymis	13	3	5	2	2	5	3	3	5	3	44
Prostate ..	0	1	0	2	0	1	0	0	0	0	4
Uterus* ..	0	0	0	1	0	0	0	0	0	0	1
Fallopian tubes (bilateral) ..	1	0	0	0	0	0	0	0	0	0	1
Vulva† ..	1	0	0	0	0	0	0	0	0	0	1
Total..	30	6	9	7	4	10	8	7	10	9	100

* Tuberculous endometritis treated by X ray therapy.
† Infection of Bartholin's gland. Primary infection pulmonary.

The immediate reaction to treatment was in most cases remarkably good; the patients put on weight with a feeling of improved health; but symptoms such as dysuria were not so quickly relieved.

Heliotherapy, if it is to expedite recovery, has to be carefully graduated. Too reckless exposure to the sun's rays generally produces ill results—blistering, pyrexia, and a mild degree of sunstroke.

The results from tuberculin treatment (T.R.) have been disappointing. Ten cases were given tuberculin for six months, and at the same time a similar number, apparently in the same stage of the disease, were treated without it. The cases treated with tuberculin did not progress so favourably as those without; they often became pyrexial with increase of symptoms.

Dysuria is difficult to relieve in severe cases of renal tuberculosis, and may demand irrigation of the bladder with boric lotion, or instillation of a solution of silver nitrate (1 in 10,000) or of flavine in glycerin (1 in 1000). Iodoform emulsion has proved beneficial in ulcerative cystitis and diathermy has helped to clear up chronic ulceration. Sandal-wood oil capsules are often effective; and a mixture of potassium citrate, tincture of hyoscyamus, and belladonna gives relief. Where a nephrectomy has been performed, the continuance of dysuria is usually due to disease of the lower end of the ureter on the affected side, and uterectomy sometimes becomes necessary. Dysuria due to tuberculous prostatitis is the most intractable form; and in severe cases the patient becomes incontinent, with an œdematous external urinary meatus. In uncircumcised patients the prepuce becomes chronically inflamed, with multiple fissures. The application of medicinal paraffin to the prepuce affords some relief.

For *operative treatment* to be successful in renal cases, early diagnosis is essential. In three cases intravenous urography showed that the disease was chiefly localised to one kidney and nephrectomy was performed with success. The removal of a calcified

kidney is not in my opinion warranted unless there are definite indications that an abscess is forming. This applies, I think, to all "dead" tubercle, since operative treatment is liable to light up the disease, and produce a generalised tuberculosis.

Orchidectomy was performed in cases where there were sinuses and the testes and epididymis had been converted into abscess cavities. Epididymectomy has not been used, and of the two patients on whom this operation was performed before admission to St. Michael's Hospital one has died from pulmonary tuberculosis and the other cannot be traced and is presumably dead.

In cases of tuberculosis of the prostate no operation other than the opening of abscesses pointing in the perineum has been attempted. One patient is still under treatment who has had three perineal abscesses incised and drained. On admission he was suffering from a rectovesical fistula, complicated by a left ischiorectal abscess, and left epididymitis with abscess formation, which necessitated orchidectomy.

Summary and Conclusions

Of 100 cases of genito-urinary tuberculosis reviewed after five years 15 are dead and 19 untraced. If the latter are presumed to be dead, the total death-rate is 34 per cent. What is known as "sanatorium treatment" is essential for this disease, and at least 12 months' treatment is required, with suitable after-care. Operation on "dead" or quiescent tuberculous foci is inadvisable.

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THE EFFECT OF AN ANTI-Vi BACTERIOPHAGE ON TYPHOID INFECTION IN MICE

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MANY attempts have been made to study the influence of different strains of bacteriophage on experimental infections in laboratory animals. Two of us (W. W. C. T. and J. W.) have previously recorded studies on the effect of phages active against *Bact. typhi-murium* (*Bact. aertrycke*) in experimental mouse typhoid, both as it occurs in individual mice and in the form of experimental epidemics. These studies, and the results published by many other workers, have recently been summarised in a report issued by the Medical Research Council (Greenwood et al. 1936), and there is no need to review the literature here. It will be sufficient to note that no satisfactory evidence has yet been obtained that a phage exerts any significant effect on the course of an experimental infection. In the report in question the present position was summed up as follows: "Although all the present indications are definitely against the efficacy of this agent in vivo, except perhaps in cholera, and although the argument of inadequate virulence or insufficient polyvalency of the phage employed cannot be accepted as a satisfactory explanation of an unlimited number of negative results, we do not think that this field has yet been explored to the point at which further search becomes useless. It is, at least, far more likely that clear and definite answers, favourable or unfavourable, will be obtained by controlled animal experiment than by any relatively uncontrolled trial in the field." The present paper deals with certain experiments that we have recently carried out along these lines.

Our earlier trials formed an extension of our previous studies on the action of various phages in mouse typhoid. Certain of these results were more promising than any that we had formerly obtained; but they were irregular and not always repeatable, and it was clear that many different factors were involved. It was far easier to induce delay in the time to death than to protect mice against a fatal attack of this particular infection. It seemed desirable to test the effect of a phage on an infection of a type that, in normal animals, leads either to rapid death or to recovery; and the isolation, by Sertić and Boulgakov (1936), and more recently by other workers, of a phage active against Vi strains of *Bact. typhosum* offered an opportunity of carrying out experiments on an infection of this type.

Experimental

The strain of phage used in these experiments was supplied to us by Drs. Sertić and Boulgakov, and the Vi strain of *Bact. typhosum* was the "Rejuvenated Rawlings" strain, for which we are indebted to Major-General Marrian Perry of the Royal Army Medical College. To each we should wish to express our thanks.

In the first experiment mice, in batches of 30, were injected intraperitoneally with a mixture containing $1{\cdot}5 \times 10^9$ phage particles and 100×10^6 *Bact. typhosum* in 0·5 c.cm. of Ringer's solution. The mixtures were allowed to stand at room temperature for approximately ten minutes before inoculation. The phages tested in this experiment were the pure anti-Vi phage supplied by Dr. Sertić (S/Vi), another pure phage supplied by Dr. Sertić that was active against both the O and the Vi forms of *Bact. typhosum* (S/O Vi), a crude mixed phage isolated by one of us (I. N. A.) from sewage, containing an anti-Vi phage (A/Vi crude), and a mixture of the pure phages S/Vi and S/O Vi. As controls 30 mice were injected with a mixture of heat-killed S/Vi phage and *Bact. typhosum*, and two batches of 30 mice were injected with *Bact. typhosum* alone. All mice were observed for 7 days. It may be noted that the pure S/Vi phage and the crude A/Vi phage produced more rapid lysis in vitro, with less secondary growth, than the non-specific S/O Vi phage.

The results are set out in Table I. It is clear that, under these conditions, the living anti-Vi phage is a very effective protective agent, while the non-specific phage has no protective effect. The heat-killed anti-Vi phage has no significant action. All further experiments were carried out with the S/Vi phage.

It is obvious that the conditions of this experiment, which has been repeated with the same results, are particularly favourable to the phage, since it had an opportunity of uniting with the bacteria in vitro before the mixtures were injected into mice. In order to determine whether a similar protective effect would be exerted when the phage encountered the bacteria in the tissues, we injected the phage intravenously and the living bacteria intraperitoneally, the second series of injections being

performed about 45 minutes after the first. The doses of phage and bacteria were the same in this experiment as in the preceding. A control group received an intravenous injection of heat-killed phage before the intraperitoneal injection of living typhoid bacilli, and a second control group received no phage.

TABLE I

Showing the effect of an anti-Vi and other phages on the intraperitoneal infection of mice with a Vi strain of Bact. typhosum. *Phage* ($1{\cdot}5 \times 10^9$ *particles*) *and bacteria* (1×10^6) *being mixed before injection.*

Phage.	No. of mice tested.	No. of mice dying.
S/Vi	30	0
A/Vi crude ..	30	2
S/O Vi	30	25
S/Vi + S/O Vi ..	30	1
S/Vi (heated) ..	30	24
None (control) ..	30	22
None (control) ..	30	23

The results are set out in Table II. It is clear that the anti-Vi phage is able to exert its protective action when it meets the bacteria in the tissues.

The next step was clearly to determine whether the phage had any curative action—i.e., whether it would exert a protective effect when administered *after* the injection of living typhoid bacilli. In this experiment the bacilli were injected intraperitoneally

TABLE II

Showing the effect of the intravenous injection of an anti-Vi phage immediately before the intraperitoneal injection of a Vi strain of Bact. typhosum.

Phage injected.	No. of mice tested.	No. of mice dying.
S/Vi	30	3
S/Vi (heated) ..	30	25
None (control) ..	30	26

into five groups, each of 30 mice. The first group received an intravenous injection of living phage immediately after the intraperitoneal injection of bacilli. The second group were injected with phage after 2 hours, the third group after 4 hours. A fourth group received an intravenous injection of heat-killed phage immediately after the intraperitoneal injection of bacilli. A fifth group received no further treatment. These last two groups served as controls.

TABLE III

Showing the effect of administering anti-Vi phage intravenously at varying periods after *the intraperitoneal injection of a Vi strain of* Bact. typhosum.

Phage injected.	Time after injection of bacilli.	No. of mice tested.	No. of mice dying.
S/Vi	At once.	30	3
S/Vi	2 hours.	30	11
S/Vi	4 hours.	30	23
S/Vi (heated) ..	At once.	30	27
None (control) ..	—	30	30

In this experiment the dose of phage was the same as before, but the dose of typhoid bacilli was increased to 250×10^6.

The results are set out in Table III. The anti-Vi phage has as great a protective action when injected intravenously immediately *after* the intraperitoneal injection of living typhoid bacilli as when injected immediately *before* (Table II). If the intravenous injection of phage is delayed for 2 hours after the injection of bacilli there is still a significant protective effect; but it is considerably reduced. If the injection of phage is delayed for 4 hours its protective action becomes insignificant. In this connexion it must be remembered that the course of this infection in mice is extremely acute. In this experiment, 23 and 27 of the 30 mice in the two control groups were dead within 24 hours.

Discussion

Typhoid infection in the mouse is a highly artificial disease. The lethal dose of bacilli, even with a virulent Vi strain, is relatively large, and toxæmic effects are marked at an early stage of a fatal infection. We should not therefore be inclined to argue too readily from the results of these experiments to infections of a more typically invasive type.

We think, however, that one problem has been decisively answered. A phage may be active in vivo as well as in vitro; and, under suitable conditions, a phage that has a specific action on the surface antigen of a virulent bacterium is capable of exerting a significant protective action when it meets that bacterium in the tissues.

In view of these findings it is clearly desirable to examine very carefully the possibility that a similar protective action may be exerted in acute or subacute infection of the typically invasive type, if the conditions are correctly adjusted.

Two of us (I. N. A. and J. W.) are receiving research grants from the Medical Research Council, who are also contributing to the expenses of this investigation.

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ŒSTRADIOL BENZOATE THERAPY IN DEPRESSIONS AT THE MENOPAUSE

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THERE is at present a reactionary tendency to minimise the importance of the climacteric in the production of psychotic or neurotic breakdowns. It is possible that the pendulum has swung too far and that research into female sex physiology by modern methods might shed light on these disorders. We accordingly decided to investigate and treat a series of patients along endocrinological lines.

Seventeen cases were chosen in which the onset of the depressive illness coincided with the onset of the menopause, as judged by the history given. As the endocrine imbalance at the menopause is associated with abeyance of ovarian function, substitution therapy with œstradiol benzoate was instituted. Unfortunately it was necessary to include in our series several patients who had been in hospital for some years before the therapy was started; and

the same shortage of clinical material made it impossible to use similar cases as controls. The psychiatric picture varied, naturally, with each individual case, but all showed definite depression without retardation, agitation, partial or complete loss of interest in their surroundings, and insomnia, while in most of them suicidal ideas were expressed. A careful physical examination was made in all.

Before treatment with œstradiol benzoate a 24-hour specimen of urine was examined quantitatively for œstrin and gonadotropic hormone. In the few cases where the patient was still menstruating, an attempt was made to obtain the urine immediately before the onset of menstruation. A glucose-tolerance curve was also done. Each patient was then given injections of 5 mg. œstradiol benzoate twice weekly, unless she was menstruating. The total amounts given varied from 60 to 140 mg. On the cessation of treatment the glucose-tolerance test and the quantitative estimation of gonadotropic hormone were repeated.

RESULTS OF TREATMENT

Of the 17 patients treated, 6 made a satisfactory recovery, as judged by their ability to return to their former occupation, and these have all remained well for at least three months (Table I). It is

TABLE I

Duration of Illness and Result of Treatment

Case.	Age.	Duration of psychosis before treatment (months).	Time since last menstrual period (months).	Result.
1	52	12	M.	Good.
2	37	6	M.	"
3	44	24	24	Unsatisfactory.
4	47	4	15	"
5	52	15	3	"
6	49	48	M.	"
7	48	6	M.	Good.
8	49	13	M.	Unsatisfactory.
9	44	48	7	"
10	48	12	M.	"
11	56	6	36	"
12	48	12	12	"
13	53	24	24	"
14	38	3	3	"
15	40	10	3	Good.
16	44	18	30	"
17	45	36	3	"

M. = still menstruating.

interesting to note that the average stay in hospital of these 6 patients after treatment began was three months, the extremes being two and five months, whereas an illness of this kind usually lasts at least nine months. Of the remaining 11 patients, 5 are still in hospital and 6 have been discharged though still far from well. These cases were in most instances less satisfactory therapeutic propositions than those that were successfully treated; in 2 of them the diagnosis was in doubt, and later development suggested that they belonged to the paranoid rather than the depressive group, while in several of the others the patients had been in hospital as long as four years before œstradiol benzoate therapy was attempted.

Œstrin, in measurable quantities, was present in the urine in 4 of the 13 cases tested, but only in very small amounts; in 2 of these cases, gonadotropic hormone quantitatively amounted to more than 50 mouse units (M.U.) per litre of urine, and in the other 2 it was less than 50 M.U. (Table II). These 4 patients were all menstruating. Two others whose urine contained no measurable quantity of œstrin were also menstruating. These 6 cases in which menstruation was still going on all showed flushings and other indications of œstrin insufficiency.

Of the 13 cases in which gonadotropic estimations were done before and after treatment, 11 gave at the start a gonadotropic finding of more than 50 M.U. per litre, and this was altered after treatment to less than 50 M.U. In the remaining 2 cases the results

TABLE II

Hormones in Urine Before and After Treatment, and Dose of Œstradiol Benzoate (Dimenformon) Given

Case.	Œstrin in urine before treatment (M.U. per 24 hours).	Gonadotropic hormone.		Total œstradiol benzoate (mg.).
		Before treatment.	After treatment.	
1	6–10	+	–	120
2	10–20	–	–	80
3	Less than 10	+	–	70
4	" 10	+	–	60
5	" 10	+	–	65
6	" 10	+	–	75
7	10–20	–	–	100
8	Less than 10	+	–	90
9	" 10	+	–	65
10	10–20	+	–	60
11	Less than 6	+	–	90
12	Not done.	Not done.	–	140
13	"	"	–	140
14	"	"	–	130
15	"	"	Not done.	70
16	Less than 10	+	–	100
17	"	+	–	75

Gonadotropic hormone + = more than 50 M.U. per litre of urine.
" " – = less " " "

before and after treatment were both less than 50 M.U. In 8 cases the glucose-tolerance curve after treatment was substantially lower than before treatment. This inhibition was found in all the cases in which the patient recovered. In all cases somatic symptoms such as flushings and backache, which were present before treatment, were abolished by œstradiol benzoate.

DISCUSSION

Frank and Salmon (1935) demonstrated that complete inhibition of the gonadotropic hormone of the anterior pituitary could be produced in menopausal women by administering œstrin. The inhibitory effect was not permanent, and gonadotropic hormone was again found in the urine in measurable quantities 28–70 days after the cessation of œstrin injections. In our series the excretion of gonadotropic hormone was inhibited in all cases in which there was an initial excess of hormone. The lowering of the sugar-tolerance curve which was noted in our cases, as in those of McCowan and Quastel (1931a and b), was probably due to the improvement in the emotional and physical state.

The results we have obtained substantially agree with those of Werner and others (1934, 1936) and of Bowman and Bender (1932), both of whom regard œstrin as having a definite effect in accelerating recovery in uncomplicated cases of involutional melancholia. Jones and MacGregor (1936) have shown that excessive excretion of gonadotropic hormone may be found many years after the menopause, and that its inhibition with œstrin therapy does not affect the clinical picture. Possibly, however, the hormonal disturbances of the menopause can sometimes be readjusted temporarily by œstradiol benzoate therapy, and thus tide the patients over the crucial period. The division between the post-menopausal syndrome (hot flushes, irritability, &c.) and complete mental breakdown is not well defined, and for the relief of the minor symptoms œstrin is usually effective.

SUMMARY

1. Seventeen cases of depression occurring at the menopause were treated with twice-weekly injections of 5 mg. œstradiol benzoate. The total amount given varied from 60 to 140 mg.

2. Six of the patients made a good recovery within five months and have resumed their normal lives. The somatic symptoms were relieved in all the patients who had them.

3. In eleven cases showing excessive amounts of gonadotropic hormone in the urine œstradiol benzoate reduced the amount excreted.

We are indebted to Prof. D. K. Henderson, physician superintendent of the Royal Hospital for Nervous and Mental Disorders, for clinical facilities, and to Prof. F. A. E. Crew for the opportunity of performing the hormone tests in his department. We also wish to thank the Organon Laboratories for a generous supply of œstradiol benzoate (Dimenformon).

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CLINICAL AND LABORATORY NOTES

CONGENITAL SYPHILIS IN A MONOVULAR TWIN

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Twins who are unequally affected by congenital syphilis have been recorded by Haslund (1924) and Dennie (1924). In all but one instance the twin pair has been considered binovular; cases have also been reported in which monovular twins are equally affected. These observations lend support to the view that differences in hereditary constitution may determine susceptibility to the congenital infection. Against this view we have the evidence of Dennie's case of twins, judged to be monovular, one of whom had marked signs of congenital syphilis and the other had no such signs. Unfortunately the diagnosis that the twins were monovular was not supported by an specific tests.

The present communication records another pair of twins who appear to be monovular and unequally affected.

Two female children, K. A. and V. A., were born on July 31st, 1922. The father, then aged 33, was a casual labourer, usually out of work, who had been sent to prison for ill-treating a dog and neglecting his children. His mental grade was such that he could probably have been certified feeble-minded. He died in 1933 with cancer of the throat. The mother was aged 30 in 1922; she is of low mentality, was sent to prison with her husband for neglecting the children, and is generally known to be an immoral character. Physically she is a poor specimen. There were four pregnancies. An illegitimate male was stillborn in 1920. The twins were born in 1922. A boy, born in 1924, is an imbecile whose Stanford-Binet score, at the age of 10 years 2 months, was 4 years 4 months. He shows no signs of syphilis, and a Wassermann test was negative. A girl, born in 1925, tested at the age of 8 years 4 months, had a Stanford-Binet score of 6 years, and can be regarded as almost feeble-minded. She is physically healthy.

K. A., aged 12 years 8 months, is physically a poor specimen with a sallow complexion, round shoulders, and flat feet. She talks clearly and sensibly, can play whist, and likes skipping; her Binet mental age is 6 years 4 months, and she is certified feeble-minded. The blood Wassermann reaction is negative.

V. A. was aged 11 years 11 months when she came under observation after having been certified an idiot. Her Binet mental age was found to be 2 years 4 months. Her speech was very defective; hearing good. She had conspicuous signs of congenital syphilis; the incisor teeth showed irregularity of the cutting edges; the nose was depressed, and she had scars around the mouth. Unfortunately she was suffering from acute tonsillitis and eczema, and died a few days later. A report, from the hospital where she was treated when aged 2 years, gives the following information. "Diagnosis: congenital syphilis. Has been a weakling since 5 weeks old. She has a twin; other child healthy. Has been wasting considerably. Wassermann reaction positive. This child had a congenital fistula from the perineum to the rectum just behind the vagina. Antisyphilitic treatment given and patient discharged still having treatment. Result: relieved."

In order to decide whether the twins were monovular, certain physical characters must be compared.

—	K. A.	V. A.
Height	5 ft. 1 in.	4 ft. 7 in.
Weight	6 st. 1 lb.	5 st. 1 lb.
Head length ..	180 mm.	179 mm.
Head breadth ..	140 mm.	136 mm.
Hair whorl ..	Clockwise right side.	Clockwise right side.
Eye colour ..	Iris has brown inner ring and peripheral white spots.	Iris has brown inner ring and peripheral white spots.
Blood group ..	A	A
Hair colour ..	Very light brown.	Very light brown.
Ability to taste phenylthiourea (0·005% solution).	Present.	Present.

Comparison of the fingerprints, right hand with right hand and left hand with left hand, shows eight correspondences of pattern; according to Stocks (1933) less than 1 per cent. of ordinary sibs have six correspondences and none haye seven.

In view of these tests and a certain general similarity of appearance it is probable that these twins are monovular and of the same genetic constitution. One can only explain the difference in syphilitic infection by assuming that environmental conditions in utero were more favourable to one twin than to the other. The physical inferiority of the syphilitic twin is shown by her smaller size and her mental inferiority is marked even though the healthy sister is feeble-minded. Since the parents are of low mental grade, syphilis can only be reckoned as a part cause of mental defect in the affected twin, but it may have reduced the grade from feeble-mindedness to idiocy.

The work was carried out under the auspices of the Medical Research Council and the Darwin Trust.

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MICROGNATHIA IN THE NEW-BORN

By C. Paget Lapage, M.D. Viet. Manch., F.R.C.P. Lond.

PHYSICIAN TO THE ROYAL MANCHESTER CHILDREN'S HOSPITAL

Micrognathia, once we recognise it, is an obvious deformity because the lower jaw is so small, but the condition is not always diagnosed. Its effects may be severe and babies suffering from it have great difficulty in respiration, with attacks of blueness of mechanical origin, due to the tongue falling back and obstructing the throat, the infant thus appears to swallow the tongue. The condition has been called glossoptosis and indeed one's first impulse is to tie the tongue forward, but this, though it may give immediate relief, is practically certain to result in broncho-pneumonia.

CASE-HISTORY

The following case under observation at St. Mary's Hospital, Manchester, is a good example of micrognathia:

A full-time male baby, aged 2 weeks, normal delivery, birth weight 6½ lb., was admitted because he was unable to suck for mechanical reasons, though there was plenty of breast milk available. He had had frequent attacks of cyanosis with difficulty in breathing and was dusky between the attacks. The bowels were regular and the stools normal.

Micrognathia in an infant aged 2 weeks.

Family history.—He was the twelfth child, five having died, the two before him at 10 and 9 weeks "because the lungs never expanded." The parents are normal, the mother aged 46. The other six children are normal. There is no suggestion of an hereditary deformity, but there might be a common factor in pregnancies.

On admission he was fairly well nourished, with a rather dusky skin. The mouth was hanging open as shown in the Figure. The lower jaw was decidedly small in relation to the rest of the face and thus the chin receded. There was no cleft palate. No abnormal sounds were found in the heart, the lungs, or the abdomen. A radiogram of the chest showed fair aeration of the lungs and some dark areas at the roots.

Treatment.—The baby had to be fed artificially, but even with a feeder it was difficult. He vomited several times each day and there were frequent attacks of cyanosis, which were relieved by propping him up and administering oxygen. It was found that posture had a good deal of effect on feeding and that the nearer the child was to being on his face the easier he was to feed. A splint was made for him as suggested by Eley and Farber (1930). It was unsuccessful and in fact increased the distress, appearing to hold the jaw forward, and it was not easy to keep in place.

Progress.—After improving a little the infant became worse and died; the post-mortem showed a hypertrophied and dilated heart, especially on the right side. There was a suggestion of a slightly patent ductus arteriosus. The lower jaw was small in proportion to the upper. There was no evidence of any continuous pharyngeal obstruction.

CAUSATION

In this anomaly the smallness of the lower jaw shows as a receding chin (see Figure). Possibly the horizontal part of the jaw is more affected than the ascending branch. The angle between the mandibular body and the ascending branch is decreased, but alters later on as the milk teeth are accommodated. Eley and Farber state that this anomaly of the jaw, like other anomalies of the jaw and ear, is associated with the first branchial arch and cleft, and the deformity is probably due to imperfect development of irregular rearrangement of the tissues composing these transitory structures. Keibel and Mall (1910) hold that there may be some inhibitory process. This seems reasonable and most authors agree that the anomaly is a simple arrest of development of the jaw (e.g., Lenstrup 1925).

Davis and Dunn (1933) say: "The lower jaw, being formed and united in advance of the upper, acts as a matrix on which the upper jaw is formed. Considering the position of the child in utero, where the weight of the entire fetal body may be readily thrown on the vertex, it is easy to conceive how pressure of the sternal region in contact with the mandible might force the forming jaws together. If this undue force occurred at a time when the lower jaw was united and the upper jaw ununited, it is easy to understand how pressure on the chin could force the partly calcified lower jaw backward, straighten the obtuse angle to almost a right angle and prevent the union of the horizontal plates, causing a cleft in the soft tissues of the palate without involvement of the alveolar ridge or lip. It would also account for the backward displacement and small size of the tongue."

According to Keibel and Mall—

"the mandible reaches its characteristic shape by the middle of the third month of fetal life. At this time the lips project about equally. Later the upper lip of the embryo grows more rapidly, so that in the fourth and fifth months it projects markedly beyond the lower lip. Normally, by a greater growth of the lower jaw and lip this difference is overcome. If, however, some inhibitory factor, such as that mentioned, occurred, the early fetal arrangement might be retained and deformity result."

This explanation seems the more reasonable in view of the fact that the jaw develops under treatment (Eley and Farber 1930).

The possibility of an hereditary element must not be forgotten and Pfaff (1913) showed the deformity to be hereditary in 50 instances and in some cases traced it through several generations. The family history in my case suggests that the last three children may have died from a similar cause and that there may have been some abnormality which developed in the mother as age advanced.

TREATMENT

Tying the tongue forward with sutures is obviously dangerous both from local considerations and from the possibility of broncho-pneumonia. Splints failed in my case but have been used with success by Eley and Farber. Postural feeding, including feeding the child by lying on his face, may succeed with special care, but the jaw may not develop as fully as after other methods. This makes us realise that the first principle in treatment is to ensure development of the lower jaw. The lower animals naturally reach out and up to feed and this led Davis

and Dunn (1933) to suggest another form of postural treatment. First of all the baby should be made to suck upwards. The mother should sit erect when breast-feeding and not allow the weight of the breast to fall on to the child's chin. They also suggest an appliance fitted to the feeding-bottle, which keeps the mouth a little distance from the teat and thus forces the child to reach out its lower jaw in the effort to suck. This helps the lower jaw to develop and counteracts the deformity naturally. Davis and Dunn show that it is quite probable that the jaw can be made to develop rapidly by mechanical treatments which aid nature. Furthermore, if no effort is made for further development of the lower jaw, adults may be condemned to hypoplasia of the lower jaw with vegetative changes in later life due to maldevelopment of the nasopharynx and imperfect ventilation. Robin (1934) shows that such work can be continued in later childhood.

The prognosis as regards both survival and development of the jaw is quite good in cases that have had suitable treatment, but there is probably a form of hereditary micrognathia running in families which is not amenable to treatment. The occasional cases, provided they have no associated congenital deformity and have developed no atelectasis, can recover with suitable exercises and management. It must be emphasised, however, that they need considerable care and individual attention before they are cured.

CONCLUSION

Micrognathia is not a common disease, but babies suffering from it may die and be labelled as inanition and congenital heart disease. They are not diagnosed and have no treatment. It is therefore worth while drawing attention to the condition, so that it may be recognised and effectively treated.

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MEDICAL SOCIETIES

ROYAL SOCIETY OF MEDICINE

SECTION OF MEDICINE

AT a meeting of this section held on Jan. 26th the chair was taken by Sir CHARLTON BRISCOE, the president, and a discussion on the course and management of

Congenital Heart Disease

was opened by Prof. BRUCE PERRY. He said he thought the best classificatory basis was that of Maude Abbott into cyanotic and acyanotic groups. He would exclude gross malformations and those incompatible with life and unrecognisable clinically. In many cases the exact defects present could not be recognised, even with the aid of radiography. The acyanotic group could be divided into those with no abnormal communications and those with arteriovenous shunt. In the former group could be placed aortic stenosis, coarctation of the aorta, and pulmonary stenosis; in the latter, patent interventricular septum or ductus arteriosus. Late cyanosis might appear in pulmonary stenosis ("cyanose tardive").

In the truly acyanotic cases the malformation had little or no effect on the activities of the patients, though some of them seemed to be liable to sudden death. Their great danger was superimposed bacterial endocarditis. Some 20 per cent. of Abbott's cases had suffered this complication. Patients needed no restriction, but every effort should be made to eliminate sources of infection. It was important that these children should live normal lives and not be allowed to develop a cardiac neurosis. Those who might have secondary cyanosis needed the same management and should lead full and unrestricted lives. The cyanotic type of case must be treated according to the depth of cyanosis and severity of symptoms. Those who showed cyanosis very soon after birth rarely survived more than five years; such cases were those of transposition of arterial trunks with patent ductus arteriosus and foramen ovale. If the cyanosis appeared at about the age of five the patient did not usually live much after puberty, but if the cyanosis were deferred to puberty, as in the Eisenmonger complex, life might be long. A moot point was whether cyanosis was incompatible with tuberculosis. Pulmonary infarction in a cyanotic case might be wrongly diagnosed as tuberculosis.

Among school-children most cases seen were acyanotic and had a patent septum. Of 87 children attending his clinic all lived perfectly normal and symptomless school lives. Very occasionally complete heart-block might complicate a patent septum. Some clinical and pathological data suggested that the foramen in the heart might be gradually obliterated by fibrosis. The hole would not increase in size with the growth of the heart, and the apparent obliteration might be due to this fact. Rheumatic heart disease was frequent among reported cases of patent foramen ovale, though it was difficult to see any direct connexion. The third type of case, which might be called pulmonary stenosis or possibly was sometimes due to patent ductus arteriosus, had a systolic thrill over the pulmonary area. Of 40 such children all lived normal lives, as did another 10 with aortic systolic thrill and murmur conducted up into the neck.

The prognosis in acyanotic cases was, therefore, good. Cases with cyanosis should lead restricted lives, but the prognosis and degree of restriction depended entirely on the severity of the cyanosis and other symptoms.

Dr. TERENCE EAST said that diagnosis was usually fairly easy if the patient lived for a few months. Cyanosis depended on hindrance of access of blood to the lungs or on a shunt. Pulmonary atresia was the extreme example. In one case he had seen the blood reach the lungs through enlarged bronchial arteries, the patient having worked successfully as a dental mechanic. Two of his patients had died of pulmonary tuberculosis. Puberty was a critical time. In one case of patent septum the murmur had disappeared at the age of four; probably the smallest holes made the most noise. Patients with congenital heart-block often had an open septum, though the nature of the connexion was obscure. He had never seen cyanose tardive. He had notes of 15 cases with pulmonary systolic murmur, enlarged pulmonary artery, and loud, palpable closure of the pulmonary valves; all lived unrestricted lives and seemed healthy. Perhaps the lesion was a stenosis with dilated artery beyond it. Some of the cases of aortic stenosis with fused calcareous

valves encountered in later life might have started as congenital abnormalities. Coarctation seemed to be well tolerated. All patients being liable to infection on their abnormality, special care must be taken of them in all mild febrile attacks. Pregnancy seemed safe with patent septum or ductus, provided the ventricle was good, but a patient with cyanosis should not run the risk. If the condition was well tolerated acyanotic cases might be accepted for life assurance, though the policy must be heavily loaded.

Dr. C. MUIR described a group of school-children, to which had been added some infants and adults. In the very young, diagnosis was difficult if not impossible. Full and unrestricted school life had given no evidence of strain on the heart in the "maladie de Roget." No case of heart-block had been associated with patent septum. Two patients had gradually lost their physical signs. Extreme care of any possible sepsis was the only precaution taken. In patent ductus there was some stress on the heart; the aorta was hyperplastic and the pulmonary artery dilated, though symptoms were uncommon. Each case must be judged on its merits. One patient had severe anginal pain. Subaortic stenosis had caused 4 deaths (2 from infective endocarditis).

Dr. J. W. BROWN spoke of cases he had seen at hospital, 19 per cent. of them having cyanosis. Intelligence seemed quite normal, and it was a grave mistake to put these children in special schools. If taught to read and write, they could support themselves by sedentary work. Ideas of prognosis needed revision; these cases might survive many years with a strikingly constant cyanosis. Infectious diseases were surprisingly well tolerated, but scarlet fever was dangerous. Tuberculosis had occurred in several of the older members. Nearly all the children were of normal height and weight. One patient had become pregnant; labour had been induced in her first pregnancy, but she had successfully gone through two subsequent ones. Patients were often disappointed at receiving no medicine, but effective and friendly supervision was the important feature of management. Oxygen was useless, but bleeding was sometimes of temporary value.

Dr. A. M. GIBSON asked whether the acyanotic group—especially cases of coarctation—should in adult life be allowed to take part in competitive athletics. He related three cases. In the first there was hypertrophy, which seemed to indicate a burden on the heart. The second had developed aortic stenosis on top of coarctation and had wished to become an air pilot. The third was an old soldier with a to-and-fro murmur such as that heard in patent ductus arteriosus, but without enlargement or disability. He had lived a very hard life with no symptoms.

Dr. EVAN BEDFORD said that school doctors in London were far too apt to refuse to allow children with congenital heart disease to attend school; this was a grave mistake. Cases with dilated pulmonary trunk and pulmonary murmur and thrill were nearly all varieties of pulmonary stenosis and not of patent ductus arteriosus. Dilatation was common beyond a simple stenosis. The origin was probably a fœtal endocarditis, of late appearance. Patients with coarctation died either of intercurrent diseases, some rupture, or endocarditis; strenuous effort should be forbidden them in adult life. Patent interauricular septum gave no symptoms at birth and cases were not often diagnosed before the age of 20. A characteristic radiogram might be presented: tremendous dilatation of the pulmonary trunk, aneurysmal pulmonary artery, small aorta, and enormous right ventricle enlargement. Infarction of the lungs often followed. In most cyanotic cases the heart was of normal size. Auricular fibrillation and death with congestive heart failure was common, but endocarditis was curiously uncommon in these cases of patent interauricular septum. They showed cyanose tardive.

Dr. LEONARD FINDLAY said that it was difficult in the acyanotic case to know whether congenital heart disease were present or not; 40 to 50 per cent. of children had a basal systolic murmur. That murmur disappeared as the child got older and its cause was unknown; it was to be regarded as functional unless it was due to patent foramen ovale. He remembered one child, of normal colour for a month, who developed sudden cyanosis with a cough and died in a few days; post-mortem examination showed nothing but patent foramen ovale and extensive broncho-pneumonia. Presumably the congestion in the pulmonary circulation had caused mixing of the circulations. This was probably the pathology of cyanose tardive.

Dr. SHIRLEY SMITH recalled an infancy syndrome similar to that described by Dr. Findlay; within a week or two the twin had also been admitted for the same syncopal syndrome and both had proved to have patent ductus arteriosus. Such cases belonged to the cyanose tardive group.

Prof. PERRY, in reply, said he had never seen congenital heart disease with congestive failure or auricular fibrillation. Coarctation was extremely difficult to diagnose and many patients lived active lives with very high blood pressure; nevertheless, he would deprecate competitive games. He would require a thrill as well as a murmur before diagnosing congenital heart disease.

LIVERPOOL MEDICAL INSTITUTION

AT a meeting of this society on Jan. 21st, with Mr. G. C. E. SIMPSON, the president, in the chair, a paper on

Congenital Cystic Disease of the Lungs

was read by Dr. ALFRED ADAMS. He said that to explain the increase in the number of reported cases there was no evidence of a greater incidence, but that it was more probable that improved radiological technique and interpretation and greater interest in chest surgery had led to better diagnosis. He described two cases recently admitted to the Liverpool Sanatorium and diagnosed as suffering from congenital cystic disease of the lung. One patient was a boy of 6, on whom a lobectomy was performed by Mr. J. T. Morrison, with eminently satisfactory results; his records were available from birth. Radiograms showed the condition of the lung at 3½, 5, and again at 6 immediately before operation, and Dr. Adams drew attention to the absence of progressive change that would be expected in infective conditions. The other case was that of a man of 38, who had a collapsed or, more probably, accessory right lower lobe, which showed well multiple cysts occupying the whole lobe, the other lobes being normal. The speaker preferred to call the condition "telangiectatic bronchiectasis." He came to the following conclusions about the disease: it occurred more commonly than published reports suggested; it was due to intra-uterine malformation, infection, or early extra-uterine infection; radiography was the best method for its detection, but the gross macroscopic changes were greatly in excess of those suggested by the radiograms; progress was

slow and radiograms taken over long periods showed little advance; symptoms, where not caused by mechanical interference, were due to secondary infections of the cysts; and finally, he believed that surgery offered the best prospect of cure.

Mr. F. RONALD EDWARDS, discussing the ætiology of congenital cystic disease of the lung, went further back than the extra-uterine infection theory. The most simple explanation of the condition, he said, was that it was purely congenital and due to lack of complete haustration of certain bronchi or bronchioles. He compared it with the haustration which occurred during the development of other organs, such as the œsophagus, where the development might be incomplete, resulting in complete lack of opening, or, as one saw occasionally, cyst formation in the area that should have become the organ. If in the lungs these cysts were isolated, the condition was one of congenital cystic disease; if, however, they communicated with bronchi, as they might if a further stage of development was presupposed, it became congenital bronchiectasis. A further interesting clinical type was the non-tuberculous pulmonary abscess, which developed and on drainage did not clear up; section of the wall usually showed columnar or cubical epithelial cells, and those cases were usually ones of unsuspected congenital cysts of the lung in which suppuration had occurred, thus bringing their presence to light.

Prostatectomy with Closure

Mr. CHARLES WELLS had prepared a film illustrating Harris's technique of prostatectomy with immediate closure of the bladder. In his absence through illness his paper introducing the film was read by the President.

Mr. Wells said that he had, so far as he knew, been the first in this country to record [1] a short series of cases operated upon by the Harris technique. He had, in the meantime, been giving an extended trial to a different type of operation—suprapubic diathermy resection of the prostate—but in the past year had returned to the Harris operation. He regretted that he had ever wavered in his loyalty to this operation, for he felt satisfied that of all the methods so far described it offered the patient the shortest and most comfortable convalescence with the smallest post-operative risk. For the small, fibrous type of gland he preferred McCarthy's transurethral technique, but there was also a small group of complicated cases in which special adaptations of the various means at one's disposal would be necessary. Thus, in a small fibrous gland with a large diverticulum it was best to do an open operation and remove the diverticulum and then resect the prostate from above by diathermy. He advocated spinal anæsthesia given in the lateral position and carefully controlled by adjusting the level of the spine by means of the kidney bridge. In poor risks he favoured an underdose rather than an overdose and suggested that supplementary anæsthesia with gas-oxygen should be given. On the other hand, he thought that a full general anæsthetic without spinal was contra-indicated, since the Harris technique prolonged the operation very considerably. The film showed also bilateral vasoligation and by means of special lighting it had been possible to illustrate quite adequately all the steps by which the prostatic bed was repaired. Mr. Wells said he now liked to use a transverse incision; it was his practice to test the adequacy of the sutures in the bladder before closing the abdominal wall and he had recently reverted to draining the space of Retzius. The series of cases upon which the paper was based comprised 30 operated upon by Harris's technique and 20 by McCarthy's in the period of eleven months immediately past.

[1] *Lancet*, 1932, 2, 1268.

Mr. A. KIRK WILSON said that he noted in the film that the hæmostatic sutures in the rim of the prostatic cavity were cut short immediately they had been tied. He himself had found that oozing points between the sutures could be controlled if the ends were left long and tied together as described by Harris. He favoured a rather longer incision that would allow the surgeon's hand to pass between the recti muscles and make enucleation possible without contaminating the left hand at the rectum. The bimanual enucleation seemed to be a retrograde step from the Thomson-Walker operation. In his most recent cases he had discontinued complete closure of the bladder. A small tube acted as a safety valve and in uncomplicated cases there was no contamination of the wound with urine; it could be removed on the fourth day and the average time of confinement to bed was not prolonged more than a few days.

Dr. W. B. BENNETT remarked that the subject was of special interest to those who had reached the "prostatic age," and that the improved technique and shorter convalescence would encourage any sufferer to submit to operation with less apprehension than in comparatively recent years.

Mr. COSBIE ROSS pointed out that many points of interest and importance had been raised. He considered that the secret of success in prostatic surgery lay in accurate selection. For example, he quoted a recent personal series of 110 cases which were divided as follows:—

Suprapubic prostatectomy	40
Transurethral resection	35
Suprapubic resection	4
Death before operation	6
Conservative measures	16
Refused operation	2
Prostatic enlargement associated with some more serious condition	7

He added that by conservative measures he meant the regulation of fluid intake and output, double micturition, controlled by occasional examination and estimation of the residual urine, and possibly in some cases the operation of Steinach II. He disagreed with primary closure of the bladder at the time of the operation. Harris himself in his several communications had stated that he regarded the retrigonisation of the prostatic cavity as the essential feature of his operation, although the primary closure has invariably been the focus of widespread interest. He emphasised the dangers of the serious complication known as clot retention when a thick adherent clot spread over the base of the bladder; this might occur in spite of the most stringent post-operative precautions. When it was necessary the same day or the day following the operation to reopen the bladder in order to remove this clot, the patient's chances were considerably lessened. He had the greatest admiration for the retrigonisation of the prostatic cavity advocated by Harris, and had practised this procedure himself, but considered that drainage with a water-suction pump was a reliable and infinitely safer method of conducting the post-operative treatment. Using this method, the abdominal wound was kept relatively dry until healing was far enough advanced for the fistula to be closed by strapping over the wound with Elastoplast. He added that another objection to the primary closure of the bladder was the large size of the in-dwelling catheter required, as this was an occasional cause of meatal stricture.

REVIEWS AND NOTICES OF BOOKS

The Extra Pharmacopœia: Martindale

Twenty-first edition. In two volumes. Published by direction of the Council of the Pharmaceutical Society of Great Britain. London: The Pharmaceutical Press. 1936. Vol. I. Pp. 1182. 27*s*. 6*d*.

THE Extra Pharmacopœia as produced by Martindale, father and son, was one of the few books which the medical practitioner, the analyst, and the pharmacist cannot afford to be without. The twentieth edition which appeared just before Mr. W. H. Martindale's death embodied the experience of fifty years, and even then he was not satisfied, for he wrote in the preface: "We plead heart and soul for more sportsmanship in our avocation." The Pharmaceutical Society has taken over all that was good in the production and has had at its command the money and skill to revise and reset the whole book.

The editor of this coming-of-age edition is Mr. C. E. Corfield whose experience as editor of the British Pharmaceutical Codex, apart from that gained by many years of research, qualified him to take over the heroic task. It is an achievement that in a book running to well over half a million words the editor has been able to include in the appropriate places a synopsis of the Addendum 1936 to the British Pharmacopœia 1932. Thus on page 378 in the monograph on cinchophenum is found "B.P. Add. 5 to 10 grains (0·3 to 0·6 g.). B.P. '32 gave max. dose 15 grains"—and this is not an isolated instance. Note also the well-considered use of abbreviations, although the full Latin names of substances—e.g., Carbonei Dioxidum—appear when they must. The fuller use of Latin titles is a little unexpected—e.g., Hepas as the heading of liver extracts, including stomach products. We welcome the inclusion on page 910 of a reference to the effect on streptococcal infections of Prontosil and some of its derivatives, given by mouth. No page has escaped revision, but what is more remarkable is the amount of the original text which was considered worthy again to see the light in these more sophisticated days. Even the therapeutic index at the end has been taken over. In fact we miss nothing except an unimportant table of infectious diseases. Some rearrangement has proved desirable. Instead of hormones and glandular products being grouped in one section entitled animal organotherapy, they are now distributed in separate sections under the headings adrenaline, œstrin, and so forth. Space has been saved by deleting notes on some of the older drugs. The book carries still further than before the entry of synonyms and proprietary names; the asterisk and registration numbers given in the old Martindale have now been replaced by the name of the manufacturer and/or agent, and the town, a system which has been tried out and proved in an appendix to the B.P.C. 1934.

The materia medica alphabetically arranged occupy 922 pages and the section of vaccines, sera, toxins, and antitoxins accounts for 66 of the remainder. The rest of the space is chiefly occupied by what is virtually a monograph on poisons and their relation to medical and pharmaceutical practice. The arrangement is most convenient, and the medical man who keeps the new Extra Pharmacopœia on his desk will rarely be caught out in his interpretation of the Poisons Rules.

The Truth about Bright's Disease

By WILLIAM R. OHLER, M.D., Harvard University, Cambridge, Mass. London: Humphrey Milford, Oxford University Press. 1936. Pp. 80. 4*s*. 6*d*.

ASSUMING that the layman wants to know about Bright's disease it would be hard to find for him anything more suitable than the present item in the series called Harvard Health Talks. Different aspects of the disease are outlined in simple non-technical language, and if it is over-simplified in places allowance must be made for the complexity of the subject. In the interests of accuracy however it should not be said (p. 26) that casts are caused by damage to the glomerular tufts. While in many instances their presence is associated with such damage there are conditions, such as Bence-Jones proteinuria, where the tufts are uninjured. Many may pick up this book to learn what they can of prognosis; hence it is deplorable that the bugbear of renal failure should be paraded in connexion with persistent idiopathic hypertension. Uncomplicated simple ischæmic nephritis does not entail renal failure. Though it can hardly be recommended as a bedside book for the nephritic, it might be read with profit by those who have the care of children. They might as a result more often summon the family doctor when infections are complicated by symptoms suggestive of acute nephritis. It cannot be doubted that many of the milder attacks of nephritis in children pass unheeded only to lay up trouble for the future, and of no disease is it truer than of Bright's disease that in early treatment lies our only hope.

Disability Evaluation

Principles of Treatment of Compensable Injuries. By EARL D. MCBRIDE, B.S., M.D., F.A.C.S., Assistant Professor in Orthopedic Surgery, University of Oklahoma School of Medicine, &c. Philadelphia: J. B. Lippincott Company. 1936. Pp. 623. 38*s*.

IN this country the Workmen's Compensation Acts provide for the payment of compensation to a workman so long as he is incapacitated from earning by reason of an injury sustained at work. The amount of his compensation is calculated upon his loss of earnings, not upon his anatomical imperfections. Similar Acts in the United States of America base the payment of compensation on the anatomical or physiological defects resulting from injury, its amount being related to pre-accident earnings. In Oklahoma, where the author practises, loss of the entire arm is compensated at 250 weeks' payment, loss of the hand at 200 weeks. Partial loss of the hand would be assessed at some percentage of 200 weeks. Dr. McBride's aim has been to resolve all injuries into terms of percentage loss to the limb, or to the whole body—to determine, as he puts it in the preface, "the extent of personal incapacity estimated with arithmetical preciseness."

On p. 47 is given the key to his method. He takes the normal part and divides full working capacity into the following percentage factors: quickness, 10; coördination, 20; strength, 20; security, 10; endurance, 20; safety, 10; and physique, 10. Functional incapacity is estimated by factors with percentage value as follows: slow action, 10; awkwardness, 20; weakness, 20; insecurity, 10; fatigue,

20; increased risk, 10; and impaired prestige, 10. He does not expect everyone to agree with him in his allocation to the various factors; someone may wish, for instance, to increase the value of weakness in functional incapacity to 40 per cent., but if this is done other factors must be decreased accordingly. Working with this key, tables are given in which an attempt is made to estimate the percentage of incapacity in almost every type and condition of injury. Taking at random a few examples—total ankylosis of the wrist in 70° dorsiflexion is equivalent to 27·6 per cent. total loss of the arm; ankylosis of the thumb at the carpo-metacarpal joint in abduction equals 26·5 per cent. loss of the thumb; ankylosis of the elbow in full extension equals 56 per cent. loss of the arm. Tables are given of the period of incapacity likely to result from any particular injury. On p. 541 we are told that the average period that will elapse before a man should return to work after complete division of the median nerve "treated by operation over three months" after the accident is 64 weeks: sciatic nerve, 64 weeks; musculo-spiral, ulnar, and peroneal nerves, 52 weeks. These figures are given as the "approximate normal healing period in peripheral nerve paralysis." No attempt is made to differentiate between types of work so that complete recovery both of epicritic and protopathic sensation as well as of muscular power must be assumed at the end of the period stated. On p. 237 we are told that complete dislocation of the knee-joint requires eight weeks' surgical care, twelve weeks' observation, and is able to begin work in 36 weeks; and on p. 128, that destruction of the shoulder-joint with suppuration has an average period of surgical care of 16 weeks and is able to begin work in 52 weeks.

The idea of this book is well conceived. Unfortunately injuries to the human body cannot be "evaluated" by abstruse mathematical calculations in a study. Only by long experience of actual examination and by the careful follow-up of large numbers of cases—not only until they cease treatment but until they have remained at work for a period of months—can any accurate estimate be obtained of the disability that may result from certain injuries in certain types of work. The danger of this kind of book is that it may be bought and quoted by medico-legal experts in court. We hope that the American courts will take a more generous view of the workman's injuries than does the author.

The British Journal of Surgery

The January issue (Vol. **24**, No. 95) contains the following articles:—

ROTATION AT THE SHOULDER: A CRITICAL INQUIRY. By Lee McGregor (Johannesburg). Arguments are advanced to show that full abduction of the humero-scapular joint involves full external rotation, and, similarly, that full flexion is possible only with full internal rotation. The author proposes that it is not essential in treating recent injuries of the shoulder-joint to restore the full range of abduction, and he advocates a position midway between full abduction and full flexion as being both comfortable and convenient.

MALLET FINGER. By I. S. Smillie (Edinburgh). Satisfactory results were obtained in 35 patients who were treated by the method here described for rupture of the extensor tendon at its insertion into the base of the terminal phalanx. A tube of Cellona plaster bandage is applied around the finger. It dries whilst the patient holds and presses the joints in the required position of flexion of the proximal interphalangeal joint and hyperextension of the terminal joint.

BLOOD PRESSURE DURING SPINAL ANÆSTHESIA. By E. Falkner Hill (Manchester). A pronounced fall of blood pressure has been observed in acute abdominal cases, occurring spontaneously with the relief of pain. This is regarded as primarily due to abolition of pressor impulses by the spinal anæsthetic, and, except in cases of severe dehydration, calls for no special treatment.

A COMPARISON OF THE RESULTS OF SPINAL FIXATION OPERATIONS AND NON-OPERATIVE TREATMENT IN POTT'S DISEASE IN ADULTS. By G. K. McKee (Norwich). In investigating 150 patients over sixteen the conclusion was reached that fixation by bone-graft is contra-indicated in the active stage of Pott's disease, since it delays anterior fusion of the bodies without providing sufficient posterior fixation to stabilise the vertebral column. It gives good results in late cases of fibrous union, where anterior consolidation has progressed as far as possible.

GASTROSCOPY: ITS HISTORY, TECHNIQUE, AND CLINICAL VALUE, WITH REPORT ON SIXTY CASES. By Hermon Taylor (London). The instrument used is a flexible gastroscope, capable of transmitting an image despite a moderate degree of curvature of the tube, and its use is described as painless, safe, and reliable. The value of the method in the diagnosis of gastritis, ulcer, and cancer is fully illustrated in the reports.

FUNNEL-NECK DEFORMITY OF THE BLADDER. By J. B. Macalpine and D. S. Wilson (Salford). The deformity is considered to be due to weakness of the internal sphincter at the base of the bladder. It occurs typically in syphilis of the central nervous system, but is found also apart from nervous disease. It is demonstrated by cystoscopy but rarely by cystography.

THE ASSOCIATION OF INGUINAL HERNIA WITH TRAUMATIC PERFORATION OF THE INTESTINE. By Ian Aird (Edinburgh). Four cases are reported in which rupture of the intestine and peritonitis followed acutely on an abdominal injury. The mechanism suggested is a traumatic force acting on a loop of intestine fixed at the ileocæcal or duodenojejunal junction and gripped at the other by contraction of muscles at the hernial orifice.

CHRONIC PEPTIC ULCER OF THE ŒSOPHAGUS: A REPORT OF EIGHT CASES. By Alexander Lyall (Glasgow). The ulcers were incidental findings during post-mortem examinations. There were two main types, one shallow and extensive, the other smaller but deeper and associated with heterotopic gastric mucosa.

RENAL RICKETS. By N. L. Price and T. B. Davie (Bristol). The condition is defined as "a disease of childhood characterised by skeletal demineralisation with resultant deformity and associated with chronic renal disease, which in uncomplicated cases terminates in uræmia." The relationship to hyperparathyroidism is discussed. The case described is regarded as being primarily of endocrine rather than of renal origin.

CHOLESTEROSIS OF THE GALL-BLADDER: A REVIEW SUPPLEMENTED BY PERSONAL OBSERVATION OF 87 CASES. By W. Arthur Mackey (Glasgow). The view is taken that "strawberry gall-bladder" is not a specific lesion and is not necessarily associated with inflammation. Symptoms when present are due to coincident gall-stones, which occur in one-third of cases, or are functional in origin and are unrelated to the lipoid infiltration of the mucosa. Cholesterosis does not demand removal of the gall-bladder.

TOXIN FORMATION IN BURNED TISSUES. By W. C. Wilson, J. S. Jeffrey, A. N. Roxburgh, and C. P. Stewart (Edinburgh). The toxic nature of œdema fluid formed in burned tissue is demonstrated by experiments on rabbits and mice. The toxicity is absent at 4 hours and maximal at 48 hours; it affects the nervous system, the circulation, and the central cells of the liver lobules. The toxin appears to be associated mainly with the globulin fraction.

A visit of the Moynihan Surgical Club to Prof. Grey Turner at the British Postgraduate Medical School is described, and there are also brief descriptions of several cases of special interest.

THE LANCET

LONDON: SATURDAY, FEBRUARY 6, 1937

RENAL TUBERCULOSIS

MODERN methods of clinical examination such as cystoscopy and pyelography have added much to the precision of diagnosis in tuberculosis of the kidney, and the recognition of the early case is altering our conception of the disease. In other organs too, notably the lung, tuberculosis is being diagnosed earlier, with the result that renal tubercle has fallen into its right place as part of the picture of a chronic infective disease in which there is metastasis in the kidney, often accompanied by metastases elsewhere. A few weeks ago Mr. HUGH LETT, in the Bradshaw lecture, gave an illuminating account [1] of tuberculosis of the kidney in this modern setting. He quoted figures to show that in the cases coming to nephrectomy there was evidence or a history of tuberculous disease elsewhere in 84 per cent. The experience of other writers tends in the same direction. In our present issue Dr. M. C. WILKINSON reports cases of genito-urinary tuberculosis at Black Notley Sanatorium of which 62 per cent. had lesions elsewhere, the largest number being in the skeletal system. On the other hand, Mr. FRANK HARVEY'S figures on another page show only 17 per cent. of cases with lesions elsewhere, the majority of them again being in the bones. The prevalence of pulmonary lesions is not much less—a point brought out in Dr. WILKINSON'S figures. There is, therefore, fairly good evidence now for believing that tuberculosis of the kidney is in the main a metastatic lesion; the emphasis has consequently shifted from the local to the general care of a tuberculous person.

Another point brought out both by Mr. LETT and Dr. WILKINSON is the greater prevalence of the disease in adults. In a recent study [2] however Dr. C. P. MATHÉ of San Francisco has found 10 per cent. of his 4698 cases of unilateral renal tuberculosis in the second decade of life, and he relates recovery after nephrectomy in two children, a girl of 8 and a boy of 10. Dr. WILKINSON suggests that the lymphatic system is a better barrier against the generalisation of the infection in childhood than it is later in life. There are probably other factors. Chronic tuberculosis is a disease of adult life; its pathological picture is different from that seen in children, and the renal lesion is a prominent part of the adult infection. These facts have a bearing on the question of operative treatment. In Mr. LETT'S opinion nephrectomy is not an operation of urgency for renal tuberculosis. Early cases and those in which the symptoms are acute should undergo general treatment first; all the writers mentioned insist upon the value of sanatorium treatment, which is as necessary before as after operation. Treatment of the tuberculous kidney is in fact following in the wake of treatment of the tuberculous joint; operation, if it is performed, is to be regarded as an unwelcome necessity. With all the progress that has been made the prognosis of renal tubercle is still grave. Recovery from unilateral disease after operation is placed by Mr. LETT at 55 to 60 per cent. for the hospital class of case, and 80 per cent. for the well-to-do. In bilateral disease the outlook is grim, but Dr. WILKINSON'S figures show, rather unexpectedly, that in the sanatorium even the association of genital with renal tuberculosis does not appear to increase the gravity of the disease. Many of these points were emphasised at a recent meeting of the section of surgery of the Royal Academy of Medicine in Ireland. Early diagnosis and sanatorium treatment are the things to aim at. Operative treatment should only be undertaken after a careful survey of all the facts and with the full realisation that renal tuberculosis is part of a general infection.

[1] *Lancet*, 1936, **2**, 1313.
[2] *Surg. Gynec. Obstet.* 1936, **63**, 283.

PENNY-IN-THE-SLOT PATHOLOGY

UNDER the title the Pathological Yardstick, Dr. L. G. COLE of New York has written [1] on the diagnosis of malignant gastric lesions. Out of 51 specimens of stomachs examined microscopically between 1927 and 1932 he chose 8; they did not represent straightforward cases, but he claims that 8 out of 51 routine examples cannot all be rarities. Sections from these specimens were shown or sent to a score or so of eminent American and Canadian pathologists, who were asked to make diagnoses and give the grounds on which they were based. The divergences of opinion are remarkable, and taken along with Dr. Cole's accounts of the patients' histories and of his own radiological findings they make amusing reading. In Case II, 23 out of 24 pathologists diagnosed a malignant condition, some carcinoma, some sarcoma or lymphosarcoma; only one regarded the lesion as a chronic inflammatory one, and he seemed to be justified in Dr. Cole's view because the patient was alive and well 12 years after her partial gastrectomy. In other cases the pathologists were more nearly equally divided in their decisions for or against malignancy. Dr. Cole seems to have been so distressed at their lack of unanimity that he has undertaken the study of microscopic sections himself, and promises us shortly another article in which he will describe "25 points of differentiation of new-growing tissue from inflammatory lesions," 25 points moreover of which not a single one was recorded in the reports of the criteria of his 24 pathologists.

This threatened invasion of its territory may rouse a little apprehension in the pathological world, but at the same time it gives the pathologists an opportunity to protest against a common misconception of their function. Dr. Cole seems to regard them as penny-in-the-slot machines: drop in a slide, pull the handle—and why are the reports not all identical? The morbid anatomist's

[1] *Surg. Gynec. Obstet.* December, 1936, p. 689.

function is to study the structural changes in the tissues of diseased animals, including man. When he brings that study to the service of patients, he is entitled to see the whole of a surgical specimen, to direct the cutting and staining of sections himself, and, if he wishes, to know the patient's history; perhaps he should exercise that right more fully than he often does. He is also entitled to disclaim omniscience; there is much in morbid anatomy that he does not yet understand—otherwise it would not attract good men to its study—and the clinician has no business to demand a yes or no answer even to such an important question as the presence of malignancy. Honest doubt, with the reasons for it, is a better contribution to pathology, and in the long run to the management of patients, than cocksure dogmatism with a dash of guesswork in it. The final responsibility in diagnosis and treatment rests always with the physician and the surgeon. Laboratory help nowadays is so extraordinarily valuable that the temptation to rely on it blindly is very strong. Yielding to that temptation leads to two evils: mistakes, from which the patient suffers, and a degenerative process among the laboratory workers themselves, who, in seeking to meet the demands so made on them, neglect the intelligent study of their subjects and convert themselves into automatic machines.

It is just this problem which has provoked Dr. DYKE's presidential address to the Association of Clinical Pathologists, which we print on another page. The clinical pathologist is the pathologist whose interest lies chiefly in the service pathology renders to medicine. Since medicine has always as its prime task the day-to-day care of patients — diagnosis, prognosis, and treatment — these matters make also a first claim upon the clinical pathologist's activities. Dr. Dyke argues that, to meet that claim, the clinical pathologist must not only be a master of his own extensive laboratory techniques but also be something of a physician himself. He must have had a good training—and preferably a higher qualification as evidence of it—in clinical medicine, and he must remain always in the closest touch with physicians and their work in the wards. Such coöperation is certainly essential if the physician is to make the fullest and, at the same time, least wasteful use of the laboratory, and if the laboratory-trained worker's precision of thought is to have its proper influence on the medical mind. Dr. Dyke's ideal head of a pathological department is to be trained in this way; he is to be a technically expert morbid anatomist, biochemist, bacteriologist, and hæmatologist. It is a large order, and it leaves no room for contact with non-clinical pathology in any of its branches, or for any excursion into experimental medicine. For the smaller hospital, however, there is no good alternative; its pathological departments must be first and chiefly "clinical." In the large university or teaching hospital, on the other hand, we feel that the pathological department has a wider function—the study of pathology in all its aspects, with the advancement of knowledge as its supreme aim. The hospital naturally provides much material for this study, but is not its only source; the department in return renders service to the hospital and for this purpose must have among its staff many members whose training and outlook towards medicine are what Dr. Dyke describes, though they will more often confine themselves perhaps to one branch or another of pathology, not each trying to be competent in the whole technical field. So the pattern of development may vary in different parts of the medico-scientific organism, which has to evolve a long way yet, with much differentiation and integration of structure and function. The clinical pathologist is a cell which may at present be a little difficult to assign to one germinal layer or another, but there is no question of his increasing value and importance. The essential thing is that he shall not lose his nucleus.

THE RUSSIAN TRIALS

THE two State trials in Moscow have shocked those of us reared in the tradition that the first duty of a court of justice is to ascertain facts, and that none should be adjudged guilty except on unshakable evidence. There has been speculation about the methods used to evoke, from revolutionaries so tough, confessions so abject and so damning. Can they be the result of torture, mental or physical; do the Soviet police use drugs, or hypnosis, to break down resistance or implant falsehoods; can the strange behaviour of the accused be explained by their unstable temperament; or is the whole affair a hoax staged by a dictator for his own purposes? The suggestion that drugs are used is nowadays not as wild as it might have seemed a few years ago. It is recognised that injections of barbiturates such as Evipan, Nembutal, and Avertin produce in suitable dosage a dreamy state of mind in which a patient may lose his inhibitions and talk more freely about his past experiences. Partial narcosis of this kind is sometimes employed in mental therapy when the object is to get information that will throw light on the patient's neurotic trouble. The rôle of the drug is to increase the rapport between patient and physician; but it does not open the unconscious mind as one lifts the lid of a box, and the work of interpreting what the patient says is made difficult because facts and fantasies come forth all mixed up as they appear in dreams—in other words, they offer clues, not evidence. Drugs, furthermore, do not permanently change the attitude of mind towards persons or things, though they may favour tendencies to change of outlook or attitude. In the patient's mind there is always a picture of the person giving the drug, with good or evil intention according as the patient is guided by his unconscious fantasies.

The drug hypothesis alone does not explain the apparent volte-face in these Russians; but there may have been a combination of drug and hypnotism. The word hypnotism is used in different senses; and if one regards it as the overpowering of the subject's will by the superior "force" of

the hypnotist, one would not expect it to be very successful in changing some of the most vigorous and masterful minds in Europe. Another and wider view of hypnotism, however, connects it with the impulse of submission. The patient identifies the hypnotist with his own conscience, and at least for a time accepts his standards and commands as if they emanated from himself. On this view hypnotism is an example of the process of accepting another attitude of mind towards people and events—a process which is most active in infancy and adolescence and which accounts for the phenomena of religious conversion and for sudden changes in people of unstable temperament. The mental impulses responsible for hypnotism are closely linked with those that bring about the submission of the group to a leader; men will unwittingly (by a process of idealisation) set up their political leader or dictator in the position of a mental ruler or law-giver in their own minds. The readiness to submission can be traced to the attitude of emotional submission which the infant experiences towards its parents, and which later by substitution is displaced on to the community in the form of submission to social conscience.

This was no common trial of common prisoners: two rival attitudes towards revolution are represented. STALIN stands for a concentration of energy upon an improvement of the conditions in the U.S.S.R., aggressive impulses being directed in the main upon inanimate nature—harnessing rivers, conquering the Arctic, and so forth. Some of the "old guard" of the Revolution, on the other hand, wish to see the immense force of the aggressive impulse in the Russian people turned to world revolution—a world revolution that must begin, moreover, by overturning, at whatever cost, the present conservative rulers of the Russian State. From a psychological standpoint the issue depends on the decision where to turn aggression. Of course aggression cannot be turned like a turret-gun, now here, now there: but one policy can give expression to fantasies and impulses that see revolution rising in every quarter of the world; another can express the desire to get satisfaction from beating the Western nations at their own game of mechanised production, from grandiose schemes of record-breaking, canal-digging, and so forth. Above all the revolutionary must be successful. He employs the dangerous weapon of aggressive revolt (in contrast to the inturned or passive revolt of the Ghandi type), and the excitement it rouses makes for instability and the overaction of feelings of guilt. His constructive impulses (contrary to what is usually supposed) are often very strong, and to the social psychologist the revolutionary differs from the reformer chiefly in the reactions of guilt arising when an attempt is made to change the old order. If he fails his mental peace is endangered not merely by the thought of toil wasted and hopes destroyed, but by a burden of unsublimated hate that finds no outlet. To all this we must here add the ingredient of self-revelation and self-torture dear to the Russian heart; the pangs of conscience, which are the warp and weft of Russian novels and now appear in the repentances of lazy comrades in the factory wall-newspapers, lend power to the central government both by reinforcing submissiveness and by giving colour to its puritan politics. The kind of State trial we have been witnessing was not a foreign thing to the accused; it is nowadays found wherever the concept of a Perfect Ruler is thought to be a necessity. Under the old régime in Russia the trial of the Jews for ritual murder of a Christian boy was a method of diverting hatred from the Czar and Church; the Jews, again, are scapegoats in Germany to-day, for a similar reason; and the men now executed themselves belonged to a party that sees everything as pure Red or pure White. The analogy that has been drawn for English readers, that the indictment is as fantastic as if LLOYD GEORGE bargained with Germany for an invasion of England by promising that HITLER should have Yorkshire, is quite beside the mark. Politics in England are not a matter of perfect Kings and Premiers and wicked Opposition but of compromise between people not wholly right or wrong. We in England find the trial and the confessions incredible because we cannot credit sane men with extremist views and passionate remorse. But the Russians (under old or new régime) run to both.

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ANNOTATIONS

EARLY CANCER AND RADIOTHERAPY

IN common belief cancer is still an incurable disease. It is because of this belief that the use of the word is avoided, and it is the reason for much of the delay in seeking advice. The patient who suspects the presence of "cancer" is apt to assume that if his fears are correct nothing more can be done, and even the practitioner is tempted to try some mild form of treatment before sending a patient to a cancer therapy centre because of the alarm aroused when he makes the suggestion. The Christie Hospital and Holt Radium Institute have wisely made use of their annual report [1] to emphasise the curability of early cancer. They deal in particular with X ray and radium therapy, although they remind us that in certain sites surgery remains pre-eminent. It is claimed that this survey covers practically the whole range of common cancers, except those of the digestive system. In 1933 1013 cases of cancer were treated, and of those 536 were alive three years later—53 per cent. The figure includes all the cases treated, the early with the late, and the importance of the stage of the cancer is brought out by the figures for cancer of the mouth. Of the cases treated in 1929, 15 were early and 60 per cent. survived five years; of the remaining 137 more advanced cases 20 per cent. survived five years; none of the very advanced lived even for three years. The figures for cancer of the breast, womb, skin, &c., are similar, and the report goes on to say that the results depend not only on the disease but on the possibility of obtaining correct treatment at an early stage.

This is the crux, for in the long run the cancer patient will come to the place at which he receives speedy and effective relief. Arrangements for this purpose in Manchester are excellent, including, as they do, a regional scheme for radium treatment on which we recently commented in a leading article.[2] The Manchester Institute is happy in having secured Prof. J. S. B. Stopford as its vice-chairman and in having a committee of management anxious to develop the hospital and its services. It is not only the extension of services to patients living at a distance, but new building and plant, including four additional X ray outfits, will soon be available and will make the department one of the largest and most modern X ray units in the Empire. A collateral expansion is going on at the same time in the physics department. The scheme tacitly recognises the fact that radiotherapy is both expensive and difficult; it is only with a highly trained and skilled staff and adequate team-work that the dangers can be eliminated. Institutes like this with their large numbers of cancers of various regions—227 cases of cancer of the mouth and 161 of the womb were treated during the year—can do good not only by curing their quota of patients but by the clinical research which determines the best measures and procedures, so that in time it is possible to deal safely and efficiently with certain types. Such centres too provide the special training in radiotherapy required for the national centres, almost all of which now include X rays with radium for the treatment of cancer. The supply of radiotherapists is still very limited; it is a small specialty which is growing daily in importance. Only a centre with long experience and a permanent radiological staff can supply the teaching and clinical material.

[1] Report for the year ending Sept. 30th, 1936. From the secretary of the Institute, Wilmslow-road, Withington, Manchester.

[2] *Lancet*, 1936, **2**, 1277.

HEALTH OF THE ROYAL AIR FORCE

REPORTS on the health of highly selected groups of persons must always provide some points of interest and although the Royal Air Force has not yet come of age, so that the more recent reports on the state of its health cannot as yet be contrasted so sharply and compared so favourably with previous reports as can those of the older services, the report [1] for 1935 makes tolerably cheerful reading. It is satisfactory, for example, to learn from the report that the incidence of sickness shows a decrease of 6 per 1000 of strength, for cases admitted to hospitals and sick quarters, below that for 1934, and is the lowest figure so far recorded. Similar low records are noted in the incidence of venereal disease, the figure for which has fallen from 9·9 to 9·5 per 1000, and in the number of invalidings from the service which fell from 5·1 per 1000 in 1934 to 4·8 in 1935. Still more strikingly satisfactory is the decrease in the incidence of injuries and diseases among apprentices which has been halved, the figure per 1000 of personnel having fallen from 115·2 to 57·3. With so much on the credit side, it would be too much to expect to find nothing on the debit side of the account and the most regrettable feature of the report is an increase in the death-rate to 4·8 per 1000, but when comparing this with the previous figures of 3·8 for the period 1928–34 and 4·3 for 1921–27, it should be borne in mind that the Quetta earthquake was responsible for 52 deaths, a contingency against which the medical services could not provide and which, it is earnestly hoped, is unlikely to arise again in the near future. Far less tragic but perhaps, in a sense, more disquieting, is the marked increase of upper respiratory tract infections among apprentices, the incidence of which almost doubled itself, rising from 267·9 per 1000 in 1934 to 514·2 in 1935, suggesting possibly a lowering of resistance due perhaps to inadequate ventilation, or massive droplet infection occurring in shops or sleeping-quarters or some such remediable factor. It is, however, only fair to state that energetic measures to prevent such infection have already been taken at Halton which was the scene of two epidemics.

The report is full of statistical data and contains many easily comprehensible charts and tables. An interesting table of medical causes of rejection for flying duties shows that defective vision was by far the commonest single cause, rejections for this being almost equal to the total number rejected on general medical and surgical grounds. The main causes of final invaliding from the service were first diseases of nervous origin which include mental disorder, epilepsy, and the psychoneuroses. This group accounted for 46 invalidings out of a total of 119. Other major causes were tuberculosis (26 cases), ear and nose conditions (14), injuries (12), acute rheumatism and urinary disease (11 each), and diseases and deformities of the limbs (10 cases). Among the principal medical causes of temporary non-effectiveness were: first, injuries; secondly, gonorrhœa; and thirdly, upper respiratory tract

[1] Air Ministry. Publication 875 (1935). H.M. Stationery Office. Pp. 101. 2*s*.

infections, with tonsillitis a bad fourth and influenza, curiously enough, among the "also ran." Of the four geographical areas in which the R.A.F. operates, the United Kingdom appears to be the most healthy, Iraq the least, with the Mediterranean Littoral and India between the two. The incidence of venereal disease, however, though greatest in Iraq, is lower in India than in the United Kingdom. The report shows that there has been a gratifying decrease in the incidence of many diseases abroad as well as at home, notably in such conditions as dysentery, malaria, and phlebotomus fever. An increase in the number of cases of psychoneurosis occurring abroad is attributed in part at least to the Quetta earthquake, and this catastrophe also accounted for a slight increase in the incidence of injury. An appended summary of the laboratory work carried out both at home and abroad shows a total of 54,885 special investigations done. Over 16,000 chemical or bacteriological investigations of urine were undertaken, nearly 10,000 throat and nose swabs examined, and 4051 samples of water were analysed, mostly in Iraq. Many other investigations such as blood counts and examinations of blood for malaria, Wassermann reactions, bacteriological examinations of pus and fæces, and microscopic examinations of skin scrapings and hairs from fungi were also carried out on a large scale.

At the hands of R.A.F. dental officers, the personnel in the United Kingdom, Mediterranean Littoral, and Iraq received much dental treatment, and 9830 were "rendered dentally fit" during the year. Another 981 were brought to the same happy state by army dental officers in India, Palestine, Transjordan, and Sudan.

ROYAL NATIONAL HOSPITAL FOR RHEUMATIC DISEASES

THE Royal Mineral Water Hospital at Bath dates back to Roman times and the modern foundation is based upon an Elizabethan Act which established the hospital for the poor from all parts of the country to benefit from the springs. For a time the Act was interpreted to mean that the inhabitants of Bath could not receive treatment at the hospital, and even at the present day only 2 per cent. of the patients are drawn from the city. As 25 per cent. of the patients have their homes in the London postal district there was justification for launching an appeal last week in London for the rebuilding of the hospital, now renamed the Royal National Hospital for Rheumatic Diseases, at a cost of £200,000. Sir Edward Grigg, who presided at the meeting, held by courtesy of the Vintners' Company at the Vintners' Hall in Upper Thames-street, told of the arrangement by which the Bath city council had provided a site nearly four times as large as the present one and nearer to the springs. Two of the governors, Mr. Sidney Robinson and his daughter Mrs. Prince, had offered to contribute £50,000 provided that the foundation was laid within twelve months. Accommodation would be provided for 250 patients, nearly 100 more than in the present hospital. Sir William Willcox, speaking as vice-chairman of the Empire Rheumatism Council, welcomed the extension of the hospital as a greater opportunity for research into rheumatic diseases. Lady Snowden, following Sir Francis Younghusband who spoke as a resident of Bath seventy years ago, directed attention to the economic loss due to rheumatism. The cost to national health insurance is, she said, £5,000,000 a year; loss of wages amounts to four times that sum, the equivalent of 6,000,000 weeks of work. The president of the hospital, Mr. C. G. Mackay, in thanking the speakers, explained that funds were available to maintain the hospital, even with the additional beds; their concern was to raise the money for a building which would benefit patients from all parts of Great Britain.

BLOOD CHANGES IN ECLAMPSIA

A FEW writers on eclampsia manage to keep their feet firmly planted on the ground of established fact, but the temptation to rise on the waxen wings of fancy has made many share the fate of Icarus. Papers based on information rather than speculation are accordingly as welcome as they are uncommon, and two recent examples deserve some attention. In the first Dr. W. J. Dieckmann [1] reports the results of a large number of measurements of the hæmoglobin, cell volume, and serum protein content of the blood in toxæmic and normal pregnancy. In eclampsia he finds that all three are generally raised, sometimes relatively—that is, compared with figures obtained at the same stage of normal pregnancy, but often considerably beyond the normal limits in non-pregnant women. The most obvious explanation of such increases is that water has escaped from the blood into the tissue spaces, and, by direct measurements of total blood and plasma volume, Dieckmann has shown that this is so. The lowered blood volume is most conspicuous when the convulsions, coma, and visual symptoms are most intense, and it disappears as the clinical condition improves. In three fatal cases the blood remained concentrated in spite of intravenous injections of fluid.

It is evident from Dieckmann's paper that anhydræmia is not the cause of the eclamptic crisis, but a secondary phenomenon. A clue to its probable cause is provided by the earlier work of G. Haselhorst and K. Mylius [2] concerning retinal changes in eclampsia. According to these authors the retinal vessels can be seen in a state of focal spasm, which is later overshadowed by exudate from the vessels. It is well known that vasoconstriction tends to increase the permeability of the vascular endothelium, and there are good grounds for the suspicion that vasoconstriction is not confined to the retinal arteries in eclampsia. The presence of anhydræmia is accordingly consistent with what may be termed the "pressor hypothesis" of eclampsia, but the cause of the vasoconstriction remains as obscure as ever. Dieckmann's observations also revive the question whether, in spite of the œdema, intravenous injection of fluid may not after all be indicated in eclampsia. This question can be settled only by clinical trial, but it seems doubtful that the fluids ordinarily used will remain in a leaky vascular channel long enough to lend material help to the patient.

In the second paper Dr. E. M. Boyd [3] describes studies of the lipoid content of the plasma and red corpuscles in 49 cases of pre-eclampsia. He has been chiefly concerned with the phospholipoids (lecithin, &c.) and total cholesterol. The ratio of the former to the latter is apparently normal in some cases and abnormally high in others. Since the ratio is also high in eclampsia he suggests that the latter group of patients may be nearer the eclamptic state than the former. It is possible that the ratio may be useful in gauging the prognosis in pre-eclampsia, but the accurate estimation of blood lipoids is by no means simple and it is not certain that the clinical

[1] *Amer. J. Obstet. Gynec.* December, 1936, p. 927.
[2] *Zbl. Gynäk.* 1928, **52**, 1180.
[3] *Amer. J. Obstet. Gynec.* December, 1936, p. 937.

examination would not give equally reliable information. Beyond this there is little to be said. Not much is known about the significance of blood cholesterol in health, let alone disease, and still less about that of the phospholipoids. An empirical quotient derived from two such mysterious entities could therefore hardly be expected to throw any light on the nature of eclampsia.

EXPERIMENTS WITH A MICROVISCOSIMETER

SINCE the viscosity of plasma depends mainly on its protein content, the determination of the plasma viscosity should be a rapid and convenient alternative to the estimation of the plasma proteins. Unfortunately methods for the estimation of the plasma viscosity have suffered from two disadvantages, one being their relative inaccuracy and the other that a fairly large volume of fluid is required. T. Satô (*Nagoya J. med. Sci.* November, 1936, p. 187) describes an accurate method requiring only 0·2 c.cm. of fluid, using a simple viscosimeter of his own design. He shows that with this method contamination with hæmoglobin does not cause a noticeable inaccuracy until the serum appears intensely red. He finds that the serum viscosity of Japanese subjects, while varying widely in different individuals, tends to decrease with age, and that in similar age-groups it is higher in males than in females. Serum dilution brought about in various ways—e.g., by bleeding and allowing the physiological restoration of the blood volume to take place, by replacing lost blood with Ringer's solution, and, in humans, by ingestion of a litre of water or physiological salt solution—led to an appreciable reduction in serum viscosity. He also showed that though physiological saline took a longer time than distilled water to reduce the serum viscosity to its minimum level, the reduction achieved with saline was longer maintained. The method should be of value for investigating the efficiency of treatment of anhydræmia such as occurs in infantile diarrhœa, cholera, and post-operative shock.

PNEUMONIA IN CHILDHOOD

PNEUMONIA in children differs so much in clinical manifestations, and particularly in prognosis, from pneumonia in adults that typical examples as judged by adult standards are almost the exception, while the so-called atypical forms are the rule. This is emphasised by Prof. R. Pierret,[1] who shows how much our knowledge of this disease has been increased by radiography. The illness often runs its course with hardly any of the proper signs in the chest. At the onset the rigor is missing; there is no stabbing pain in the side; the cough may be absent; and there is no sputum. In fact fever is almost the only constant disturbance. Pierret lays stress on the importance of auscultation high up in the axilla where a small patch of fine râles may be discovered: a central pneumonia usually appears in a radiogram as a triangular shadow with its base in the axilla. Breton and Christiaens[2] describe several other varieties of triangular shadows and their modifications such as the linear strip across the middle of the right side of the chest when the disease affects the lower part of the right upper lobe. Pneumonia in the right middle lobe also modifies the standard triangle and the apex of the lower lobe may present quite characteristic shadows. The evidence in favour of a central pneumonia seems to be definitely established by studies of this character. Pierret emphasises the benign nature of pneumonia in children, and so does Dr. A. M. Gill[3] in a report from the children's department of the Middlesex Hospital on what he calls "simple pneumonitis." He describes the clinical picture of a child with a persistent cough of recent origin, loss of appetite, and sometimes loss of weight. The child is listless but at this period of the disease there is no fever. Clinical examination shows slight impairment of percussion note over a limited area, with normal or weak vesicular breath sounds and fine râles of a persistent and "sticky" character. X ray examination shows some mottled shadowing in the same area, and within a week or two, irrespective of treatment, all symptoms and signs disappear. The child's general condition steadily improves and further radiography shows complete resolution of the pathological process. Possibly such a child has passed through a lobar pneumonia of a mild type but Gill is inclined to think this unlikely. He looks on the illness as the result of a low-grade inflammatory process chiefly affecting the pulmonary alveoli.

[1] *Écho méd. Nord*, 1936, **6**, 1061.
[2] *Ibid*, p. 1077.

A NEW HÆMOPOIETIC FACTOR?

EVIDENCE is accumulating which suggests that the effective hæmopoietic principle in liver is probably a combination of factors with somewhat different actions. In a series of papers Jacobson and his colleagues[4] have shown that it is possible to isolate three chemical substances from liver which exert varying effects on hæmopoiesis in animals and man and which to obtain a maximum effect in man must be given together. The complex nature of the liver principle is further emphasised though perhaps not clarified in an important paper by Dr. Wills and her collaborators in our present issue. Wills and Stewart[5] described in 1935 the experimental production of a megalocytic hyperchromic anæmia in monkeys which appeared to be closely allied to tropical megalocytic anæmia. Monkeys with this type of anæmia were used in the present investigation, and it was found that it responded well to campolon (a relatively crude liver extract), whereas anahæmin (the purest available preparation) was inactive except in one instance. Further it was possible to separate campolon into two fractions according to their solubility in saturated ammonium sulphate. One of these, which was thought to contain anahæmin, was inactive in monkeys but curative in human pernicious anæmia; the other was active in monkeys. Similar fractionation of yeast extracts also yielded two fractions: the soluble one was effective in monkeys while the insoluble was not. These observations suggest that the cause of nutritional megalocytic anæmia in the monkey—and probably of tropical megalocytic anæmia—cannot be a simple lack of Castle's extrinsic factor in the diet, as has been usually assumed. Nor can the cause be a lack of active principle present in anahæmin, since anahæmin which cures pernicious anæmia does not cure monkey anæmia. There seem rather to be at least two hæmopoietic principles in all these extracts (e.g., liver, autolysed yeast extracts, and wheat germ) which are active—some only after incubation with normal gastric juice—both in nutritional megalocytic anæmia and in pernicious anæmia. The crude extracts like campolon contain both principles, while the

[3] *Middlesex Hosp. J.* 1937, **37**, 20.
[4] Subbarow, Y., Jacobson, B. M., and Prochownick, V. (1936) *J. Amer. chem. Soc.* **58**, 2234.
[5] Wills, L., and Stewart, A. (1935) *Brit. J. exp. Path.* **16**, 444.

purer extracts like anahæmin contain only one. The fact that one monkey reacted to anahæmin, given after parenteral injection of the "monkey fraction" from yeast, also suggests that this factor may be needed for normal hæmopoiesis in the monkey; but usually the dominant deficiency in the experimental anæmia is of the other—at present unidentified—principle. Wills thinks this may be allied to the vitamin-B_6 fraction of the vitamin-B_2 complex. Chemically it appears more closely allied to the substance isolated by Cohn, McMeekin, and Minot [6] from liver than to anahæmin or hæmopoietin. Observations on the effect of anahæmin on tropical megalocytic anæmia will throw more light on this complex but important hypothesis. Theoretically anahæmin should be inactive in this condition.

THE SURGICAL RELIEF OF IMPOTENCE

IMPOTENCE is often due to flaccidity of the ischiocavernosus and bulbocavernosus muscles; they become no longer capable of compressing the efferent vessels. To counteract this flaccidity O. S. Lowsley and J. L. Bray [7] have devised an operation in which they expose the muscles through a perineal incision and tighten them with catgut sutures. Since the muscles are so soft and delicate that sutures rapidly cut through them, it is essential that ribbon-gut be used. Out of 51 patients operated upon, 31 have been cured, most of the failures being in men over sixty-three. Lowsley and Bray say that the muscles of men of advancing years are infiltrated with fat and that this may lead to failure of the operation. The chief difficulty appears to lie in the selection of suitable patients. The elimination of all cases of psychological impotence goes far to restrict the use of this otherwise valuable surgical procedure, for in the opinion of many authorities some 80 per cent. of cases belong to this class. Nevertheless there are cases in which this new technique should be of great service. According to the authors the most spectacular cures have been achieved in those who have been rendered impotent by perineal injuries due to operation or by rupture of the urethra by straddle injuries or other violence.

LIMITED QUARANTINE

FROM the beginning of this week most passenger ships bound for New York have been able to go straight to their piers and land passengers without calling at the quarantine station. This has been made possible because the U.S.A. authorities have now put into force the plan drawn up six years ago by the International Health Office in Paris for an international code of signals (see Code, vol. 2, Radio, p. 229). The New York Order of Jan. 22nd grants to ships which carry a doctor the facilities envisaged in the plan for the wireless transmission of standard quarantine messages by ships shortly before their arrival in port. From the passengers' point of view the advantages of the new Order vary according to the class they are travelling. Saloon and tourist-class passengers are not normally inspected, but they will save time. Steerage passengers (and presumably the crew) will now be relieved of the march past the quarantine officer. It should be noted that the new Order does not confer any rights on passengers; it simply grants a privilege at the discretion of the quarantine authorities. A similar system has been in force in the principal British ports for some years and is working satisfactorily. Its adoption in New York is a welcome advance since hitherto quarantine in the United States, though applied in a fair and impartial manner, has been rigorous. Other countries will, it is hoped, take note of the relaxation and follow suit.

CAMBRIDGE DEGREES

AT Cambridge the degree of M.B. is withheld from medical graduates until they have written a thesis. When a candidate passes his final examinations in medicine and surgery, he receives only the degree of bachelor of surgery; and though this is a registrable qualification, entitling its possessor to practise medicine, surgery, and midwifery, the fact remains that the official abbreviation, *B.Chir.*, conveys little or nothing to the public. Thus the Cambridge man is under a disability, compared with graduates of other universities, until he has found time and opportunity to write an M.B. thesis. The task is a forbidding one, for he is (or was) warned that "great weight will be given to evidence of independent observation and reflexion." The thesis, he was further told, "is an integral and highly important part of the exercises required for graduation"; but in a report issued last week the faculty board of medicine announced that they have decided to recommend its abolition. The grounds for this decision are that the theses actually submitted seldom contain anything very valuable, that their composition interferes with hospital work, and that their assessment imposes an excessive burden on the regius professor of physic, who now has much else to occupy him. It is proposed therefore that in future the two degrees of M.B. and B.Chir. shall be taken simultaneously after passing the final examination, and that present holders of the B.Chir. shall be allowed to proceed to the M.B. without further test. The welcome this news should receive from those it affects will be tempered by an associated suggestion that a higher standard be demanded of candidates presenting theses for the degree of M.D.

THE CONSEQUENCES OF PHILOSOPHY

THE ordinary man finds it hard to live and breathe in the tenuous atmosphere of pure philosophy. To him (and in this he is perhaps basically sound) philosophy is argument, not solution, and his interest in the argument is largely determined by his interest in the arguers. It is something of a paradox that explorers in the most abstract regions of human thought should be ranked, not according to problems they have solved, but according to the manner in which they have set about solving them. How well Plato realised this personal and dramatic element in philosophy is shown by his choice of the mime as his model for philosophical presentation. When we read in a little book [1] that it is an answer to Planck and Einstein our interest is at once aroused. Here is the "set" for the perennial comedy of the little man and the big man—Eiron and Alazon, David and Goliath, Socrates and his accusers in Plato, the accusers and Socrates in Aristophanes, Sancho Panza and Don Quixote, my Uncle Toby and my Father Shandy, Laurel and Hardy—in this guise has each man in his degree learned wisdom. Can the little man make the big man look foolish? If so it is good philosophy and good comedy. When the author adds, as an afterthought to his title, that

[6] Cohn, E. J., McMeekin, T. L., and Minot, G. R. (1930) *Trans. Ass. Amer. Phys.* **45**, 343.
[7] *J. Amer. med. Ass.* 1936, **107**, 2029.

[1] The Consequences of Philosophy. A reply to Planck and Einstein. By Max Mundlak. London: John Bale, Sons and Danielsson. 1936. Pp. 86. 3*s*. 6*d*.

he is making "a philosophical attempt to mediate between the positivists and the supporters of the metaphysical hypothesis," we but chuckle the more. He is like the comedian making irrelevant apologies for his own ridiculous appearance. It is thwackings we want not mediation; to mediate is to spoil the sport. In point of fact Mr. Mundlak gives us a couple of hours good entertainment with himself as Eiron, and such portentous performers as Planck, Einstein, Eddington, and Jeans as alazons. There are some nimble mental acrobatics and enough of the thwackings to hold our interest. The big man is not allowed to get away with it that the tensor calculus and quantum mechanics makes him any wiser, in the Socratic sense, than the little man, and to see the dénouement of this satisfying little plot, whether it be in a book of philosophy or in a picture house, is always worth the moderate price charged for admission.

FLOODS IN THE OHIO BASIN

DURING the past month floods have caused much inconvenience in parts of Britain and other European countries, but the inundation of an area, comparable to that of Great Britain, in the vast system of rivers which normally finds an outlet into the Gulf of Mexico at New Orleans is a calamity rather than an inconvenience. It is reported that 400 people have died, 800,000 homes have been flooded, more than 500,000 people are still homeless and more than 250,000 are marooned in their homes or other refuges—and still the flood is spreading. Influenza, pneumonia, typhoid, and even small-pox are rife. In one town alone over 200,000 have been inoculated against typhoid and the U.S. Army has taken over the task of removing the population from threatened areas. It does not need a vivid imagination to picture the terror and anguish caused by the disaster in the whole valley of the Mississippi and its tributaries, the full effects of which will only become evident when the water recedes, leaving slime, filth, corpses, carcasses of animals, relics of homes, with no doubt fresh outbreaks of disease. The sympathy of the world will go out to the United States in these appalling conditions.

How is such a disaster caused? Why is the greatest river system in the world unable to deal with its waters? Readers of Mark Twain will realise that the Mississippi although a very large river is a very variable one, and the same is true in degree of its tributaries. All these rivers bring down vast quantities of silt which, in warm weather, when the flow is slow and the viscosity of the water is low falls out of suspension and causes mud banks, which are continually shifting as flow varies, but cannot shift quickly enough to let a sudden increase in flow get away to the sea or to lower reaches, without causing considerable rises of river level. The banks are notoriously low, but in many places have been raised, either naturally by deposits of silt or artificially by construction of levees or river walls. These protect large areas near the rivers from flooding during normal periods of heavy flow, but if they give way under water pressure or if the water rises over them only serve to increase the magnitude of the flood.

The comparative mildness of the winter, so far, has led to precipitation of rain rather than snow, and this precipitation has been excessive—it is said that the rainfall in the Ohio Valley for a fortnight has been equal to a normal six months fall. This, instead of being retained in the hills and lowlands of the basin as snow, which, when melted by the increasing sunshine of spring, would normally flow into its natural channels at a steady rate, regulated by the rate of melting, has rapidly run into the rivers and streams. The flow has been too rapid for the water to carry away enough silt to increase the capacity of the channels for the greater volume passing through them, so they have overflowed their banks, and where two streams unite the inadequacy of the channels becomes still more marked. It is not easy to see what can be done to avoid a recurrence of disaster, since neither rainfall nor temperature can be regulated; and although from some points of view it is unwise to build cities or villages on the banks of rivers liable to flooding, yet the advantages of being on a navigable stream are great, and the sites are likely again to be occupied. The construction of levees enables small floods to pass away without serious damage, but accentuates greater ones. Probably the proper remedy is to maintain sufficient channels by dredging; but this is costly and would necessitate the formation of a Mississippi Conservancy Board and some interference with the liberty of various States. If excessive flow cannot be prevented means must be taken to let the water get away. After all the average rainfall of North America is rather less than that of Europe.

HALLEY STEWART

THE medical profession has good reason to be grateful to Sir Halley Stewart. The trust fund which he founded "for research towards the Christian ideal in all social life," and which latterly reached a capital sum of £350,000, was construed so broadly as to include medical research. Grants have been made from the Trust to research on tuberculosis, cancer, and asthma, and to found a fellowship of £500 for three years tenable in the neurological research unit at Queen-square. It is understood that the Red House at Harpenden in which he lived is now to become a hospital. Halley Stewart was the tenth of a family of fourteen children and lived a life of singular vitality, ended a few days after spending his 99th birthday in apparent good health. His elder son is a member of the medical profession, and the name of the younger appears in this week's Honours List in recognition of social service in which he has carried on his father's ideal. Sir Malcolm Stewart was the first Commissioner for the Special Areas of England and Wales.

INDEX TO "THE LANCET," VOL. II, 1936

THE Index and Title-page to Vol. II, 1936, which was completed with the issue of Dec. 26th, is now in preparation. A copy will be sent gratis to subscribers on receipt of a post card addressed to the Manager of THE LANCET, 7, Adam-street, Adelphi, W.C.2. Subscribers who have not already indicated their desire to receive Indexes regularly as published should do so now.

ROYAL SOCIETY OF EDINBURGH.—A David Anderson-Berry gold medal, together with a sum of about £100, will be awarded in July, 1938, by this society for the best work recently produced on the nature of X rays in their therapeutical effect on human diseases. A similar award will be made every three years. Applications for the prize may be based on both published and unpublished work and should be accompanied by copies of relevant papers. They should reach the general secretary of the society, 22, George-street, Edinburgh, 2, by June 1st, 1938.

PRINCIPLES OF MEDICAL STATISTICS

VI.—FURTHER PROBLEMS OF SAMPLING: PROPORTIONS

In the previous section the concept of the standard error was developed, and was illustrated by the calculation of the standard error of the mean. In addition it was pointed out that every statistical value calculated from a sample must have its standard error—i.e., may differ more or less from the real value in the universe that is being sampled. For example, the standard deviation, or measure of the scatter, of the observations will vary from sample to sample, and its standard error will show how much variability this value is in fact likely to exhibit from one sample to another taken from the same universe. In practical statistical work a value which is of particular importance, owing to the frequency with which it has to be used, is the *proportion*. For example, from a sample of patients with pneumonia we calculate the proportion who die. Let us suppose that from past experience, *covering a very large body of material*, we know that the fatality-rate of patients with pneumonia is, let us say, 20 per cent. (the actual figure, from the point of view of the development of the argument, is immaterial). We take, over a chosen period of time, a randomly selected group of a hundred patients and treat them with serum. Then, presuming that our sample is a truly representative sample of all patients with pneumonia—e.g., in age and in severity—we should observe if serum treatment is valueless about 20 deaths (it may be noted that we are also presuming that there has been no secular change in the fatality-rate from pneumonia). We may observe precisely 20 deaths or owing to the play of chance we may observe more or less than that number. Suppose we observe only 10 deaths; is that an event that is likely or unlikely to occur by chance with a sample of 100 patients? If such an event is quite likely to occur by chance then we must conclude that serum *may* be of value but, so far as we have gone, we must regard the evidence as insufficient and the case unproven. Before we can draw conclusions safely we must increase the size of our sample. If, on the other hand, such an event is very unlikely to occur by chance we may reasonably conclude that serum is of value (that is, of course, having satisfied ourselves that our sample of patients is comparable with those observed in the past in all respects except that of serum treatment). Before we can answer the problem as to what is a likely or an unlikely event we must determine the standard error of a proportion—i.e., the variability of a proportion in samples of a given size taken from the same universe. Presuming the treatment is of no help, then the fatality-rate we should observe on a very large sample is 20 per cent. (or nearly that). How far is the rate likely to differ from that figure in samples of different size?

SAMPLE OF ONE

If our sample comprises only one patient the fatality-rate may be either 0 or 100 per cent.; if the patient dies the fatality-rate is greater than that of past experience; if the patient recovers this is obviously not very convincing evidence in favour of our treatment for, according to past experience, 4 out of 5 patients are likely to recover without our treatment (20 per cent., or only 1 in 5, die).

SAMPLE OF TWO

If the sample is increased to two patients, three events become possible, (i) both may recover, (ii) 1 may recover and 1 may die, (iii) both may die.

On the basis of past experience we can calculate the probability of each of these events occurring. (i) The chance that one may recover is 4/5; the chance that the other may recover is also 4/5; the chance that *both* will recover is the product of these two independent probabilities—i.e., $4/5 \times 4/5 = 16/25$. (ii) The chance that one patient will recover is again 4/5; the chance that the other will die is 1/5; the chance that *both* these events will occur is, therefore, $4/5 \times 1/5$; but this value must be multiplied by 2, for the event can happen in two different ways—viz., patient A may live and patient B die, or patient A may die and patient B live. The probability, therefore, of observing one recovery and one death is $2\ (4/5 \times 1/5) = 8/25$. (iii) Finally the probability of each patient dying is 1/5 and of both patients dying is $1/5 \times 1/5 = 1/25$. We can tabulate these values as follows:

Event.	Probability of event.	Fatality-rate per cent.
Both patients recover ..	16/25 = 0·64	0
One patient recovers, one dies	8/25 = 0·32	50
Both patients die	1/25 = 0·04	100
—	25/25 = 1·00	—

The total probability is 1, for there is no alternative to these three events. Clearly the only event that suggests that our treatment is of value is the recovery of both patients, when the fatality-rate is 0 compared with the 20 per cent. of past experience. The death of one patient in a sample of two gives a fatality-rate of 50 per cent., and of both patients one of 100 per cent., both rates being worse than past experience. But the more favourable event, the recovery of both patients, is obviously an event which is more likely than not to occur by chance; it may be expected to occur 64 times in 100 trials with 2 patients even if the treatment is ineffective. Therefore with a single sample of 2 patients and a normal fatality-rate of 20 per cent. the chance that both will recover is large, and if such a result is observed we cannot deduce from it that our special treatment is of value.

SAMPLE OF THREE

If we increase the sample to three patients four events become possible, (i) all 3 may recover, (ii) 2 may recover and 1 die, (iii) 1 may recover and 2 die, (iv) all 3 may die.

The probability of each event can be calculated as before. (i) The chance of the recovery of all three patients is $4/5 \times 4/5 \times 4/5 = 64/125$. (ii) The chance that two may recover and one die is $4/5 \times 4/5 \times 1/5$; this must be multiplied by 3, for this event can happen in three different ways since any one of the three patients may be the one to die; this equals 48/125. (iii) The chance that one may recover and two may die is $4/5 \times 1/5 \times 1/5$, also multiplied by 3 for this event can also happen in three ways; this equals 12/125. (iv) Finally, the chance that all three may die is $1/5 \times 1/5 \times 1/5$, an event which can happen

only in one way, and equals 1/125. Tabulating we have:

Event.	Probability of event.	Fatality-rate per cent.
Three recover	64/125 = 0·512	0
Two recover, one dies ..	48/125 = 0·384	33·3
One recovers, two die ..	12/125 = 0·096	66·7
Three die	1/125 = 0·008	100·0
—	125/125 = 1·000	—

The only event that favours our treatment is, again, the recovery of all the patients. Any other event gives a higher fatality-rate than that of past experience—viz., 20 per cent. But the recovery of all 3 patients is an event which is quite likely to occur by chance; it may be expected to occur 51 times in 100 trials with 3 patients even if the treatment is ineffective. With a single sample of 3 patients, therefore, the chance that they will all recover is large, and again we cannot deduce that our special treatment is of value.

SAMPLE OF FOUR

If we increase the sample to four patients five events become possible, (i) all four may recover, (ii) three may recover and one die, (iii) two may recover and two die, (iv) one may recover and three die, (v) all four may die.

What is the probability of each of these events on the basis of past experience? (i) The chance that all four recover is $4/5\times4/5\times4/5\times4/5$; this event can happen in only one way, and the probability equals 256/625. (ii) The chance that three recover and one dies is $4/5\times4/5\times4/5\times1/5$, multiplied in this case by 4, for there are four different ways in which this event can happen; any one of the four patients can be the one to die. The probability of this event is also, therefore, 256/625. (iii) The chance that two recover and two die is $4/5\times4/5\times1/5\times1/5$, multiplied in this case by 6, for there are six ways in which the event can happen. For if the patients are named A, B, C, and D, the following events are possible:

Recover.	*Die.*
AB	CD
AC	BD
AD	BC
BC	AD
BD	AC
CD	AB

The probability of this event is, therefore, 96/625. (iv) The chance that only one recovers and three die is $4/5\times1/5\times1/5\times1/5$, multiplied, as before, by 4 (for any one of the four may be the fortunate one to recover); this equals 16/625. (v) Finally, the chance that all 4 will die is $1/5\times1/5\times1/5\times1/5=1/625$. Tabulating:

Event.	Probability of event.	Fatality-rate per cent.
All four recover	256/625 = 0·4096	0
Three recover, one dies ..	256/625 = 0·4096	25
Two recover, two die ..	96/625 = 0·1536	50
One recovers, three die ..	16/625 = 0·0256	75
All four die	1/625 = 0·0016	100
—	625/625 = 1·0000	—

Once more the recovery of all the patients is the only result which gives a fatality-rate lower than that of past experience, but this, again, is an event quite likely to occur by chance; it may be expected to occur nearly 41 times in 100 trials with 4 patients even if the treatment is ineffective.

SAMPLE OF TEN

We can with samples of any size calculate by these methods the probability of favourable results occurring merely by chance; as the sample increases in size, however, the calculations become progressively more laborious. But clearly we need not calculate *all* the probabilities. If, for example, we treat ten patients then the only results which are better than that of past experience are those which give no patients at all dying or only 1 patient dying—i.e., fatality-rates of 0 or 10 per cent. If two of the ten patients die the fatality-rate is normal according to past experience, 20 per cent., and if three or more die then it is higher than that of past experience. The probability of all 10 patients recovering equals $(4/5\times4/5\times4/5\times4/5\times4/5\times4/5\times4/5\times4/5\times4/5\times4/5)=(4/5)^{10}=0{\cdot}1074$; the chance of 9 patients recovering and 1 dying $=\{(4/5)^9\times(1/5)\}\times10$ (for any one of the 10 may be the one to die)$=0{\cdot}2684$. Either of these events gives a result better than past experience, and the probability of observing by chance one *or* the other is the *sum* of the two probabilities, or $0{\cdot}1074+0{\cdot}2684=0{\cdot}3758$. In other words we should expect to get a better result than past experience nearly 38 times in 100 trials with 10 patients even if serum treatment were quite ineffective. Obviously in a single sample of 10 patients a result better than that of past experience is still not an unlikely event to occur by chance, and from such an observation we cannot deduce that serum has reduced our fatality-rate.

SAMPLE OF A HUNDRED

If now we return to our original problem—namely, a sample of 100 patients of whom only 10 die—the probability we need is that with which this result *or a better one* might be expected to occur even if our treatment with serum were quite ineffective—so that we ought to have observed 20 deaths on the basis of past experience. It is *possible* to calculate this by just the same means as were applied to smaller numbers. Tabulating we have the results shown on the top of the opposite page.

The sum of the probabilities will give the number of times we might expect to reach a result as favourable as the one we have observed, or even more favourable, merely as a result of chance. This sum is 0·0057, and we may conclude that only 57 times in 10,000 trials with a hundred patients would such a result turn up merely by chance. Such a result, therefore, suggests that our treatment favourably influenced the survival-rate. But this calculation is extremely heavy and some shorter method is in practice essential.

THE GENERAL CASE

Let us return to the tabulation regarding two patients. This shows, if we write it in percentage form, that if we had 2 patients in each of 100 hospitals the fatality-rate would (on the average) be 0 in 64 of these hospitals, 50 per cent. in 32 of the hospitals, and 100 per cent. in 4 of them. From these figures we can calculate the *mean* fatality-rate in the 100 hospitals and the *standard deviation* of the frequency distribution round that mean. The mean fatality-rate is $(64\times0)+(32\times50)+(4\times100)\div100=20$ per cent., and the standard deviation will be found, calculated by the ordinary methods, to be 28·3. A similar calculation

Event.	Probability of event.			Fatality-rate per cent.
All 100 recover	$(4/5)^{100}$	=	0·00000000020	0
99 recover, 1 dies	$(4/5)^{99} \times (1/5) \times 100$*	=	0·0000,0000509	1
98 recover, 2 die	$(4/5)^{98} \times (1/5)^2 \times 4{,}950$	=	0·000000063	2
97 recover, 3 die	$(4/5)^{97} \times (1/5)^3 \times 161{,}700$	=	0·0000005147	3
96 recover, 4 die	$(4/5)^{96} \times (1/5)^4 \times 3{,}921{,}225$	=	0·00000312	4
95 recover, 5 die	$(4/5)^{95} \times (1/5)^5 \times 75{,}287{,}520$	=	0·00001498	5
94 recover, 6 die	$(4/5)^{94} \times (1/5)^6 \times 1{,}192{,}052{,}400$	=	0·00005928	6
93 recover, 7 die	$(4/5)^{93} \times (1/5)^7 \times 16{,}007{,}560{,}800$	=	0·0001990	7
92 recover, 8 die	$(4/5)^{92} \times (1/5)^8 \times 186{,}087{,}894{,}300$	=	0·0005784	8
91 recover, 9 die	$(4/5)^{91} \times (1/5)^9 \times 1{,}902{,}231{,}808{,}400$	=	0·001478	9
90 recover, 10 die	$(4/5)^{90} \times (1/5)^{10} \times 17{,}310{,}309{,}456{,}440$	=	0·003363	10

* These multipliers are the number of different ways in which the event could happen. Clearly there are 100 ways in which 1 could die and 99 survive; there are 4,950 ways in which 2 could die and 98 survive, and so on.

for three patients gives a mean fatality-rate in the 100 hospitals of 20 per cent. and a standard deviation round it of 23·1; for four patients the mean is 20 per cent. and the standard deviation is also 20·0. The *mean* fatality-rate in samples of each size—viz., 20 per cent.—is the value, it will be noted, that we expect to reach according to past experience; but in the individual sample we shall not necessarily observe this mean value, for round it there will be a variability in the fatality-rate from sample to sample, due to the play of chance, measured by the standard deviation and decreasing as the size of the sample increases. If we could calculate this standard deviation *without* having to find the different probabilities for each event we should have a measure of the variability that will occur by chance in the fatality-rate in samples of different sizes. This calculation is, in fact, very simply made. If on the basis of past experience we expect 20 per cent. of patients to die and 80 per cent. to recover, then the standard deviation round that expected 20 per cent. will be in samples of 2 equal to the square root of $\frac{20 \times 80}{2} = 28{\cdot}3$, in samples of 3 equal to the square root of $\frac{20 \times 80}{3} = 23{\cdot}1$, and in samples of 4 equal to the square root of $\frac{20 \times 80}{4} = 20{\cdot}0$. These values are the same as those found above by the longer calculation. In more general terms the standard deviation, or as it is usually termed the standard error, of a percentage is $\sqrt{\frac{p \times q}{n}}$, where p is the percentage of individuals belonging to one category (e.g., alive), q is the percentage in the other category (e.g., dead), and n is the number of individuals in the sample. We can, therefore, readily find the standard error of the percentage—i.e., the variability it would show from sample to sample—in samples of 100, or more, patients. With 100 patients the standard error is $\sqrt{\frac{20 \times 80}{100}} = 4{\cdot}0$. In other words, on the basis of past experience we should expect 20 of the 100 patients to die, but in different samples of that size we should not always observe that proportion dying; the proportions observed in samples of one hundred will be scattered round 20 with a standard deviation of 4. We know (as was shown with the standard error of the mean in the previous section) that there will be relatively very few samples in which the proportion actually observed will differ by more than twice the standard error from the mean expected value. For instance, with 100 patients we expected 20 per cent. to die, but as this percentage has, in samples of this size, a standard error of 4, we might by chance observe a value in a single sample as high as $20 + 2(4) = 28$ or as low as $20 - 2(4) = 12$. Actually we observed a value of 10 per cent. This is beyond the value that might, *according to our criterion*, be likely to arise by chance and, *other things being equal*, we may deduce that it *appears likely* that serum treatment lowered the fatality-rate. The italicised words must be emphasised. It must be recognised that we are weighing probabilities, never, as is sometimes suggested by non-statistical authors of medico-statistical papers, reaching "mathematical proof." A difference between the observed and expected values *may* be a "real" difference (in the sense that the treatment was effective) even though it is not twice the standard error; but the calculation shows that the hypothesis that the difference has occurred by chance is equally valid. If, on the other hand, the difference between the observed and expected values is, say, four times the standard error, this does not "prove" that it is "real" difference; it may still be the result of chance. But the calculation shows that the hypothesis that it is due to chance is unlikely to be true, for such a chance difference is a rare event. The advantage of the calculation is that the investigator is thus enabled "critically to estimate the value of his own results; he may be prevented from wasting his time by erecting some elaborate superstructure of argument on a difference between two averages (or proportions) which is no greater than a difference that might well be obtained on drawing two random samples from one and the same record" (G. U. Yule; Industrial Health Research Board, Report No. 28, 1924, p. 6).

Finally, presuming that the difference recorded between the observed and expected values is more than would be expected from the play of chance, then we must consider carefully whether it is due to the factor we have in mind—e.g., serum—or to some other factor which differentiated our sample—e.g., age or severity of disease—from the general population of patients. Where, as Yule expresses it, "some particular interpretation is rather attractive," the investigator must be the more on his guard.

For the sake of clarity the standard error of the proportion has been deduced on the basis of a figure known from past experience. In actual practice such a figure is not often available or may be an unsatisfactory criterion of the expected level in the observed sample, owing to some secular change. The more usual procedure is the comparison of two percentages recorded over the same period of time in an experimental and a control group. The development of this test is discussed in the next section.

Summary

A statistical value which is of particular importance, from the frequency of its use, is the proportion, or percentage. By simple means the standard error of this value can be calculated, that is the amount of variability it will show from sample to sample for samples of different sizes. The relation of the difference between an expected percentage and an observed percentage to this standard error shows whether that difference is likely or unlikely to have arisen merely by chance. As a convention we take twice the standard error as a criterion. If the difference is more than twice the standard error it is said to be "significant"—i.e., unlikely to have arisen by chance; if it is less than twice the standard error the difference is said to be "not significant"—i.e., it may easily have arisen by chance. The test always involves weighing probabilities, and can never amount to proof in the logical sense. The test can give no information as to the *origin* of the difference beyond saying that chance is an unlikely explanation.

A. B. H.

SPECIAL ARTICLES

HEARING-AIDS

A REPORT TO THE MEDICAL RESEARCH COUNCIL

THE accurate investigation of deafness is a product of the recent advances in sound reproduction and recording which have followed telephone engineering and broadcasting. The application of these to the alleviation of deafness is not a simple one, for individual deaf persons vary in the extent to which they are deaf to different pitches of the auditory range. Dr. and Mrs. Ewing and Dr. Littler,[1] who have prepared a report which has been published by the Medical Research Council, are pioneer advocates in this country of group hearing-aids for classes of severely deaf children, and they show that these aids are safe to use and do not cause any deterioration in hearing.

They open their report by summing up the problem to be considered as follows:—

(1) How does the ear of a partially or severely deaf patient behave when stimulated by loud sounds and to what extent can speech be made intelligible to him by amplification?

(2) What are the characteristics of the most efficient type or types of aid?

(3) What tests will ensure that the patient may be effectively advised as to what, if any, type of aid is suitable to his individual needs?

They emphasise the first of these three questions, since the deaf patient must be supplied with a portable instrument which will enable him to follow the speech of any speaker under conditions which are little, if at all, subject to his control and often most unsuitable for sound reproduction by any existing mechanical means. It is known that, no matter how short the duration of sound, there is an average upper limit of intensity at all audible frequencies for people with normal hearing. Intensities beyond this upper limit cause discomfort or pain, and the limit is therefore sometimes called the threshold of feeling. The area between this and the threshold of audibility is the auditory-sensation area. This area is restricted in the deaf patient in the sense that his defect prevents him from hearing a sound of intensities and often of frequencies which are audible to the normal ear. No hearing-aid can restore the capacity to respond to sound over the lost range. A highly sensitive aid may amplify a whisper to such an extent that it rises above the raised threshold of audibility, but that part of the area for which he is deaf remains dead ground for all time. The normal ear can respond effectively to sounds ranging from a whisper (something like 15–30 decibels) to that of speech so loud as to approach the threshold of feeling (130 decibels). Efficiency in the supply and use of hearing-aids requires, in the first place, the measurement of the patient's threshold of minimum audibility for speech. This is most conveniently expressed in terms of the standard intensities used to give levels of loudness for speech, music, and noise. For example, a patient who is so deaf that his threshold of audibility for speech is 60 decibels above that of normal listeners cannot be expected to follow average *mezzo forte* conversation at a distance of three feet, for such conversation has an intensity value of approximately 55 decibels above the normal threshold of audibility. A speech threshold 100 decibels above normal implies that there is little capacity to hear speech even uttered in a loud voice close to the ear. Thus the measurement of the threshold of audibility for speech shows the extent to which the deafness interferes with the ability to follow speech, and it also indicates the degree of amplification needed to bring sounds of different levels of loudness within the patient's range of hearing.

Speech is, of course, a mixed sound, but nevertheless the threshold of audibility for it can be reliably deduced from the threshold for pure tones, and these can be ascertained by means of a pure tone audiometer or beat-tone oscillator. Generally the speech threshold is within 5–10 decibels of the lowest reading for pure tones. Experiments were made both by air-conduction and by bone-conduction. The subject was seated in a sound-proof room and signalled to the operator in another room when he could hear the sound. When speech was being tested, and not pure tone only, the speaker sat inside the sound-proof room with his lips twelve inches from a microphone. The word "bah" was used for pure hearing, and various single syllable words closely resembling each other, or meaningless double-syllable words were used to test intelligibility. Only two of the patients tested had sufficient acuity for average *mf* conversation at three feet. For one of them *mf* conversation was 10 decibels quieter than a whisper would be to a normal ear. He was the least deaf of the nine patients, but a course of lip-reading

[1] A. W. G. Ewing, M.A., Ph.D., I. R. Ewing, M.Sc., and T. S. Littler, M.Sc., Ph.D (Department of Education of the Deaf, Victoria University of Manchester): The Use of Hearing Aids. Medical Research Council, Special Report Series No. 219. 1937. Pp. 40. 9*d*.

lessons combined with the use of a high quality amplifier for lectures (he was a university student) caused a marked improvement in his examination results. Two patients were so deaf as to be unable to hear any speech unless it was louder than an *ff* voice and less than three feet from the ear. To them the noise in weaving sheds (96 decibels), for which normal subjects need ear defenders, is very little above the threshold of audibility.

DANGERS AND VALUES OF HEARING-AIDS

It is important to know whether patients suffering from aural lesions should listen to very loud sound. Very large intensities are often necessary if they are to hear speech with a maximum degree of intelligibility. U. Yoshi has shown that excessive stimulation may cause degeneration of the cochlea, and it is commonly believed that the noise in boiler works induces deafness. In addition to the possibility of damage to the ear, there is the fact that loud sound not physically injurious is often psychologically objectionable. The degree of loudness physiologically undesirable is ascertainable by quantitative experiment; the sensation is not merely objectionable but makes the withdrawal of the ear from the receiver a reflex and inevitable act. Auditory fatigue is experienced by normal subjects when they listen to pure tones at large intensities for two minutes or more, but deaf subjects seem less susceptible than the normal to this form of fatigue. The magnitude of the fatigue is related to the duration of the stimulus, and as the loudest components in speech vowels never last longer than half a second, the fatigue does not appear when the speech is amplified. Daily use of a powerful hearing-aid for a long time has not been followed by any change in auditory acuity.

The authors of the report think it very desirable to devise a standardised test for intelligibility of amplified speech. The most reliable test stimuli are standard lists of syllables; numbers and familiar words can be recognised when very imperfectly heard. Such a test has considerable diagnostic value, for speech cannot at present be made fully intelligible by any known aid when deafness to high frequencies is associated with cochlear and nerve lesions. Other partially and severely deaf patients can be enabled to hear speech with approximately 100 per cent. intelligibility.

It is possible to measure the effective amplification of various hearing-aids; the most satisfactory results are yielded by those instruments which approach most nearly to uniform amplification over the frequency range 200 ~ to 8000 ~. Valve amplification is indispensable if this is to be attained. Non-valve battery aids give some help to a number of patients but their usefulness is greatly limited by their low amplification and the undesirable character of their frequency response. Most non-valve aids reduce the intensity of sounds of high frequency and so can never compensate for severe deafness to upper tones. Bone-conduction receivers show the same limitation, and are not, in their existing form, an economical means of using the output of an amplifier. All electrical aids present the problem of background noise, but in varying degrees, depending on the ratio of noise to sensitivity of the microphone and amplifier in use. Background noise can be measured in decibels and the measurement shows whether any particular subject will hear it or not. Tests on 158 adult patients attending a clinic during eighteen months showed that 94 could obtain a good deal of help from a portable valve aid, 18 from non-valve battery aid, 2 from bone-conduction battery aid, and 16 from speaking-tubes only, while 28 could get no help from any aid. An aid is most effective in a quiet room with good acoustic qualities and when listening to clear speakers. Even when the most efficient type of aid available is used, lip-reading is essential if the deaf person is to suffer the minimum disability from his deafness.

THE DEAF CHILD

The authors have also made a prolonged study of deafness in children. They tested 236 children attending a school for the deaf and found that no less than 149 of them could benefit educationally from hearing-aids. Of 27 children attending elementary schools, or special schools for the mentally retarded, and not making good progress, 24 were found to be deaf in varying degrees and were of the type which could make good progress if they were referred to a school for the deaf. Only 3 were actually mentally retarded. It has been found impossible to make pure tone tests of pre-school children owing to their lack of interest and inexperience in listening to meaningless sounds, but a series of tests have been devised in which the young child learns to play in response to sounds. These tests give reliable but non-quantitative evidence of the degree of deafness and the type of ear training on which to base the development of speech. Hearing-aids for class teaching are in use in a number of schools for the deaf, and a comparison has been made between classes which have received systematic teaching by combined hearing-aid and lip-reading and those without these facilities. The comparison is even more satisfactory than had been anticipated. It is essential in class teaching that the teacher should speak close into the microphone, and therefore a class amplifier is better than individual aids used at a distance from the teacher. The class amplifier is also an advantage in discussions and conversation classes. The child is in a different position from the adult. His development in speech and his educational progress depend on the acquisition of new ideas associated with a new language, and faithful reproduction of the highest quality is therefore vital. Education and speech development normally advance together, and the quality of the hearing-aids for educational purposes affects results to a very marked degree.

Dr. and Mrs. Ewing and Dr. Littler conclude that the conditions under which hearing-aids are supplied to the public should include: (*a*) tests of the patient's response to pure tones of the speech range; (*b*) a standardised articulation test of the patient's capacity to respond to amplified speech under controlled conditions; (*c*) articulation tests with the instrument which it is proposed to supply to the patient for a period of trial; (*d*) familiarity, on the part of those responsible for the supply of aids, with the physical characteristics of each type of instrument, especially its frequency response and effective amplification.

MEDICINE AND THE LAW

Hire-Purchase Research

IF any medical practitioner has been persuaded to sign a contract with the Consolidated World Research Society Ltd., he may be interested in the experiences of one who decided to cancel his bargain. This limited company offers an encyclopædia on the instalment system and, like other sellers of similar

publications, employs canvassers to commend its merits to potential buyers. The books are not the sole inducement. The purchaser who signs the contract obtains also certain additional privileges of advice in research. Exactly what these privileges may be is a question which seems to be left to the canvassers to answer. If the usual printed copy of the agreement is signed, the subscriber thereby requests delivery of "The Consolidated Encyclopædia, comprising ten volumes in de luxe artcraft binding." Simultaneously he asks that his name be enrolled as a subscriber to the following services: (*a*) perpetual illustrated quarterly extension service for a period of ten years, (*b*) binders for the quarterly extension service, and (*c*) registered membership of the Consolidated World Research Society Ltd. for ten years. For all this he agrees to pay something down forthwith, and specified further instalments at specified intervals until the amount reaches £19 10*s*. "which covers the total cost of all the benefits described above." Then comes a paragraph which stipulates that the contract is not subject to cancellation, and makes the purchaser declare "I have entered into this contract solely upon the terms and conditions herein contained and irrespective of any representations made to me by any of your representatives." This frank provision, which the subscriber has possibly not studied before signature, leaves the company's canvassers a free hand to promise every kind of advantage to the purchaser. In the circumstances it would be only natural if they were very promising salesmen. If our readers should ask what are the profitable features of "registered membership" of this limited company, we can find little guidance for them on the face of the printed document. There may well be something more explicit in the eloquence of the canvassers whose persuasiveness the contract so ruthlessly repudiates. If our information be correct, the verbal inducements include the promise of consultative facilities and the prospect that the subscriber, instead of having to wait many years to establish himself in his profession, will meet with accelerated recognition and will be brought into touch with prominent figures in the world of medical research and medical practice. These suggestions seem to gather some confirmation from a paragraph marked "Important" on the back of the printed contract. The paragraph is somewhat vaguely headed "Information for Service Department"; it could be argued that it does not commit the company to any legal undertaking. "Much," it says, "of the value of the extension service and advice privileges for which you have enrolled will come from the personal relation that will develop between us. So that our Research Staff may come to know you better, we suggest, as time progresses, that you keep us posted regarding the subjects in which you are particularly interested." The privileges of membership, we repeat, so far as they depend upon the printed agreement, lack both definition and value. One, at least, of the medical subscribers has placed on record his experience of them. He signed the printed contract and paid a deposit of £1 10*s*., but, being dissatisfied with the representations made to him by the company's agent, he afterwards repudiated the agreement. The company issued a summons in the county court, claiming £18 as the balance due for purchase of the encyclopædia. The defendant doctor, having taken the advice of the Medical Defence Union, put in a defence on oath in which he gave his own version of the transaction as follows:

"I accepted the verbal offer of the representative of the plaintiffs . . . that, for a fee of £1 10*s*. down and ten subsequent yearly payments of £1 10*s*. each, the plaintiffs' society would answer any research questions by me up to a specified number per annum, and I made the first payment of £1 10*s*. to him accordingly.

". . . I discovered I had been fraudulently deceived and misled by the plaintiffs' representative, and applied to the plaintiffs for a return of the £1 10*s*. paid by me.

"Any contract set up by the plaintiffs as made by me to purchase any encyclopædia or other books was obtained by fraud and wilful misrepresentation by the plaintiffs' representatives."

It must have been an uncomfortable reply for the Consolidated World Research Society Ltd. to receive. No commercial undertaking can relish so whole-hearted an allegation that its agents are obtaining business for it by fraud. The defendant doctor, however, was not given the opportunity to repeat his story in court. A few days before the date fixed for hearing, notice to discontinue the claim was filed on behalf of the society. If the society feels it has been unlucky in devising a system of enterprise which permits such allegations to be made, it will doubtless reconsider its method of doing business.

PARIS

(FROM OUR OWN CORRESPONDENT)

THE COMMERCIAL IRRADIATION OF FOODS

SOME rather unkind things were said at a recent meeting of the Academy of Medicine by Dr. E. Lesné about the so-called irradiation of various foods by enterprising manufacturers who seem to have rushed in where scientists have been so many tender-footed Agags. At the present time in France you may not only buy irradiated milk and flour over the counter, but also pastries, sugar, chocolates, and so forth, all supposed to have been pumped full of various vitamins. It was pointed out that these preparations are either inactive, in which case their usefulness is limited to the vendor, or they are active, in which case they may be potent for evil as well as for good, and ought, therefore, to be sold only on the prescription of a doctor. It seems that, as a rule, these preparations are in fact more or less irradiated, however little may be known of the dosage, the possible harm being anticipated from over-dosage, and the loss of other properties, presumably beneficial, entailed in the processes of irradiation, for it was suggested that, with the increase of vitamin D, the irradiated substances may lose some or all of their vitamins B and C. The whole subject is, indeed, bristling with so many problems still unsolved that the Academy of Medicine adopted a resolution that foods artificially enriched with vitamin D must not be on sale except in a pharmacy, and then only on a medical prescription. Such preparations must not be sold until their freedom from toxic substances is established and they can be guaranteed not to be injurious to the consumer. A further stipulation was that the vitamin-content of such preparations should be accurately gauged by biological tests made regularly in an approved laboratory. It remains to be seen how far the adoption of this resolution by the most important medical body in France will inhibit the activities of manufacturers straining at the leash in their efforts to give potentially suffering humanity the benefits of recent research with the minimum of delay and the maximum of faith.

A SUIT FOR NEGLIGENCE

Certain interesting sidelights on the responsibilities of doctors, nurses, and chemists were thrown by a

recent lawsuit arising out of a death from tetanus. Having run a rusty nail into her foot while walking in her garden in a suburb of Paris, a woman of 40 sought the advice of a doctor who, on the day of the accident, prescribed an injection of antitetanus serum. He instructed a so-called nurse to give this injection. The husband took the prescription to a pharmacy, where he was given by mistake a bottle of antidiphtheria serum. While she was about to give the injection, the nurse noticed the mistake, and while she hesitated, the husband insisted: "Prick her, for it will do her good all the same." Though she saw the doctor next day, the nurse omitted to mention this matter. When, five or six days later, complications appeared, the doctor was summoned and found evidence of tetanus. He was surprised at the impotence of the injection he had prescribed, but no one informed him of the mistake that had been made. An urgent prescription for antitetanus serum was sent to the same pharmacy where the same mistake was repeated, this time four bottles of antidiphtheria serum being supplied. This was too much for the nurse, who insisted on these bottles being changed for others containing veritable antitetanus toxin. Its injection was, however, incapable of averting death eight days after the accident. It transpired in the course of the legal proceedings that the vendor of the first supply of serum was not a fully qualified chemist; he was not even a student in pharmacy. The nurse also proved to be a housekeeper bereft of any nursing certificates or diplomas. In the first instance the vendor of the first lot of serum was sentenced to six months in prison, the pharmacist himself (it was he who had sold the second lot of serum) to four months, the doctor to a small fine, while the nurse was acquitted. On appeal, negligence was imputed to all concerned, the nurse included. Though the terms of imprisonment were not imposed, the publicity given to this case should prove salutary in many ways, not least in the matter of the employment of undependable and untrained persons in responsible positions.

SELF-ADVERTISEMENT IN AUTOBIOGRAPHY

A communiqué recently issued by the Fédération des Syndicats Médicaux de la Seine is a perhaps praiseworthy attempt to bridle the enterprise of those of its members who from time to time are solicited for biographical sketches of themselves, with or without photographs, also of themselves. The recipients of these solicitations are informed that the character of the publication in which their autobiographies will appear is strictly scientific, but that the exigencies of printing, &c., necessitate the payment of a subscription. For even in the world of science, you must pay your way. The unappreciative attitude of the Fédération with all necessary clarity gives its considered opinion that such autobiographical activity constitutes more or less disguised self-advertisement, is contrary to the rules of ethics, and is justly condemned by the medical profession.

IRELAND

(FROM OUR OWN CORRESPONDENT)

MEDICAL RESEARCH IN THE IRISH FREE STATE

THE scheme to establish and endow medical research in the Irish Free State appears at length to be nearly accomplished. It was announced last week that the certificate of incorporation of a Medical Research Council had been issued. It is now more than two years since a draft scheme was submitted to the Minister for Local Government and Public Health for his approval by a representative committee which had been formed on the initiative of the Royal Academy of Medicine in Ireland. In accepting the scheme, with certain amendments, the Minister has also sanctioned, as a temporary measure, a grant of £10,000 per annum from the Sweepstake Funds. Should the council justify its existence by successful activity, it is hoped that in the future provision may be made for the establishment of a Research Institute. Funds will for the present be devoted to giving scholarships at home and abroad, and to grants for specific purposes. The council is to consist of eight persons, the chairman to be appointed by the Minister, and the other seven by the several universities and medical schools and the Royal Academy of Medicine. The chairman's name has not yet been announced, but the following have been nominated by the several bodies named: University of Dublin, Prof. J. W. Bigger; University College, Dublin, Prof. Henry Moore; University College, Cork, Prof. J. M. O'Donovan; University College, Galway, Prof. J. F. Donegan; Royal College of Physicians of Ireland, Prof. T. G. Moorhead; Royal College of Surgeons in Ireland, Prof. W. J. E. Jessop; and Royal Academy of Medicine in Ireland, Dr. J. W. McGrath.

BOOKS FOR HOSPITALS

Some months ago the Minister for Local Government and Public Health had given his approval to a grant from Sweepstake Funds for the purpose of providing books for the reading of hospital patients. A committee for the purpose has now been appointed by the Minister, and the first meeting was held on Feb. 2nd.

TRINITY COLLEGE, DUBLIN, MEDICAL SCHOOL

There have been some changes in the anatomy department at Trinity College, Dublin, and the abolition of the separate dissecting room for women in the anatomy department removes a relic from the pioneer days of women medical students. Since last term all have used a joint dissecting room and the vacated space has been converted into a reading room. Among the new appointments are those of Dr. E. D. Adrian, of Cambridge, who will deliver the John Mallet Purser lectures this year, and Dr. E. B. Alabaster, who has been appointed to the Mary Louisa Prentice lectureship in ophthalmology.

FELLOWSHIP OF MEDICINE AND POST-GRADUATE MEDICAL ASSOCIATION.—A special course for the primary F.R.C.S. examination will be given at the Infants Hospital on Mondays, Wednesdays, and Fridays, at 5.15 P.M. (physiology), and 6.30 P.M. (anatomy, from Feb. 22nd to May 24th). An all-day course in medicine, surgery, and gynæcology will be given at the Royal Waterloo Hospital from Feb. 22nd to March 6th. A week-end course in children's diseases will be held at the Princess Elizabeth of York Hospital on Feb. 20th and 21st. M.R.C.P. courses will be held as follows: clinical and pathological course, National Temperance Hospital (Tuesdays and Thursdays, 8 P.M., Feb. 16th to March 4th); chest diseases, Brompton Hospital (5 P.M. twice weekly, Feb. 22nd to March 20th); heart and lung diseases, Royal Chest Hospital (Mondays, Wednesdays, and Fridays, at 8 P.M., March 1st to 20th); neurology, West End Hospital for Nervous Diseases (afternoons, March 8th to 20th). An all-day course in proctology will be given at St. Mark's Hospital (March 1st to 6th).

GRAINS AND SCRUPLES

Under this heading appear week by week the unfettered thoughts of doctors in various occupations. Each contributor is responsible for the section for a month; his name can be seen later in the half-yearly index.

FROM A ROVER

I

FREEDOM to indulge oneself in "unfettered thoughts" was too great a temptation to resist. Here's "fun," I said to myself, using a word which we grown-ups have borrowed from our children. Anonymity for several months, too, and with a fair chance that any curiosity which may have been aroused at the moment the article was read will have died before the half-yearly index appears. And "tut, tut" was a sufficient answer to the kill-joy spirit which held up the bogy of a supposition that some all-too-clever reader might divine, from internal evidence—either by the text or by the style (or lack of it)—who the writer really was. "But that's fun, too, for some people," added the spirit of mischief, and the recollection that I had myself played this game with some, nay most, of the "Grains and Scruples" that had preceded these of mine—not being a cross-word puzzle fan—egged me on rather than restrained me. There's "A Chronicler," for example, whose name is now out; who else could have produced those four articles but the doyen of medical writers, he who might appropriately say in his defence, if charged with not coming within the category of "doctors in various occupations," what Iphicrates said when he was charged with not being any particular sort of soldier, "I am not indeed, I confess, but I am he who commands all of them and employ them as occasion serveth."

* * *

"A Chronicler" discusses the important question of educating the lay public on matters of health, and he has in mind, in particular, the medium of the lay press. I want to unfetter a few thoughts on this subject.

We may just as well face the basic facts, which seem to me to be these. The average reader lusts to know things about diseases and remedies *when these concern himself*. I agree that matters of epidemiology and statistics, and even the latest advances in bio-chemistry or bacteriology, interest him much less. But not only must the matter served up to him, if it is to be popular, have the news value incident upon its application to his own body, there must be news value in the personality of the man or woman who writes it. This means that the identity of the writer shall be revealed, and here comes the conflict with the traditions of the profession in this country. So long as these traditions remain—and most of us believe it to be in the public interest that they should remain—so long will the impasse last.

* * *

The proprietor of a daily paper who recently approached a well-known doctor on this matter, and who thought the veto upon signed articles dealing with health matters was "all my eye," was offered a series of articles by a panel of medical men who should be experts upon the various subjects dealt with. He was told that he might preface the articles by publishing a list of the names on the panel, but that no individual article would be signed. Payments for the articles were to go to the Royal Medical Benevolent Fund. His reply was that he would pay five guineas each for articles contributed on this basis and one hundred guineas for each article if it were signed *and if he might choose the writer*.

A short time ago the B.B.C. introduced into its programmes a series of talks upon health. The various subjects with which the speakers dealt were all of them calculated to interest the man in the street. The speakers were chosen by a high official at the Ministry of Health, but the names of the speakers were not published. The name of the doctor who introduced the series, however, *was* published. It was presumed that he would not deal with any specific disease, and indeed the text of his talk was "vetted," no doubt with this embargo in mind.

* * *

They do this sort of thing very differently in America as, of course, they do many other things differently! In the U.S.A. there is what is called "The Open Forum." In a large hall, filled with people, eminent medical men and women, themselves in active practice, descant upon diseases upon which they are recognised authorities. The address is broadcast, and the "hook-up" extends to several million hearers. "The Open Forum" is organised by the State Medical Society, which is the equivalent of our B.M.A.

* * *

A heap of difficulties present themselves in a full consideration of this controversy. Cold anonymity creates no real interest in any article on a special subject and "our medical correspondent" may be the sub-sub-editor with a flair for pseudo-medical knowledge or a newly fledged doctor bent on supplementing his—as yet—all too slender fees by turning an (?) honest penny in this way; in either case the title to real knowledge is suspect. If we hand over this function to those who have the ability to write and who yet, being retired, cannot be said to be getting an advertisement out of the publication of their names, the reader is quick to know that the writer is out of touch with live patients and so is prone to doubt if he is getting "the goods," and we know that his doubts, if not justified to-day, will be justified to-morrow.

* * *

Again, this task cannot be left to a doctor *merely* because he writes well. Was it not of Goldsmith that Garrick said, he "wrote like an angel and talked like poor poll"? A doctor may be a good publicist and a poor practitioner. Indeed, it has been said that in proportion as a medical man is a good publicist he is probably a bad doctor. Least of all those to whom this business of health education can be entrusted is the obsessionist. And we have such amongst us. To one or two of these, "operating" in the past two decades, we no doubt owe the fact in part that the great majority of us have decided to leave the thing alone, lest worse harm befall the public than has befallen it already. When "A Chronicler" tells us that "the remedies and adjustments for human defaults, physical and other . . . cannot be standardised for individuals, since many factors having quite different values will be present,"

he is probably influenced a little by the appalling blunders committed in the name of health education by those who have laid down, in the daily press, universal rules and prescriptions regardless of age, sex, height, weight, complexion, temperament, occupation, and a number of other considerations. There are tears for these things.

Yet I cannot somehow think that our American friends are entirely wrong. I felt sure the diabetes specialist was wrong when he talked about acidosis "to the general," even without defining the word, and that this wasn't remedied by the known fact that his reputation was international. But I do feel that there is something that wants doing, not by way of "medical advice" for individual needs, but by way of general knowledge about the human body, about diseases, and about the principles that underlie both preventive and curative Medicine.

* * *

One of my chief reasons for thinking this is that I believe such information, if given truly, lucidly, and attractively, would be a valuable set-off against the credulity, quackery, and commercialism with which the public is saddled. I would go so far as to say that if this one object were kept well in mind by the writers, with complete frankness, and with some courage, a valuable social service might be rendered. But whether the newspapers would open their columns to matter which exposed the gigantic frauds now practised upon the ignorant public by the vendors of patent medicines, patent foods, and "medical" gadgets of divers kinds, is another question. The advertisement manager might well intervene. But we should at least know if the grievance made against us by sections of the lay press, that we keep from their readers information and help which it is our duty to give them, is genuine and sincere.

As it is, we see a host of new and fictitious diseases being constructed, the basis of all of which is none other than the cleverly concealed fact that "its your money we want." "Night starvation"; "spring face"; "starch heaviness" . . . . . .

Fleet Street history still tells the story of a record coup made by an enterprising daily paper when three letters, appearing on three successive days in the "splash" page, over names which carried weight, stopped completely in 24 hours the enormous sale of a patent medicine which did *not* contain what it said it contained and *did* contain something that was not revealed. No one seriously supposed that the main purpose of the paper was to render a philanthropic service. Yet this was undoubtedly done. Surely the time is ripe for another coup? I throw out the hint for all whom it may concern.

* * *

Coming back to the matter of the traditions of the profession in respect of advertising, the salient point is clear and, I hope, ineluctable: a doctor must rely for his reputation upon the work he does in his own sphere, be it general or consultant, not upon mere publicity, and the value of this work must be judged by his colleagues and by his own patients. The sick person, and his friends, must not be put in such a position that they are influenced to consult him by reading his articles in the lay press or by seeing his photograph there. It has been said that it is not possible nowadays for a doctor to have prestige without a certain amount of publicity, whereas it is possible to have a lot of publicity without much prestige. That is true, and should be remembered in extenuation of some paragraphs in the lay press concerning which the doctor is the victim and not the culprit. In the last analysis we are all of us either social or anti-social. The doctor is tempted to be anti-social almost every day of his life. He may lower the standard if he likes, but if he believes that the present canons of professional ethics are in the public interest he must come into line with them, not only passively but by active resistance against attacks made against them.

PANEL AND CONTRACT PRACTICE

Understudying the Dentist

LAST year Dr. X, an insurance practitioner in London, charged 10*s*. to an insured person on his list who applied for his services late one night on account of bleeding from a tooth socket. In July, 1936, the London insurance committee ruled that the service rendered fell within the definition of the proper and necessary medical services which the practitioner is required by his terms of service to render. The insurance committee therefore decided to deduct the 10*s*. from the practitioner's remuneration and to refund it to the insured person.

Dr. X appealed against the decision in order to raise the general question of the scope of the terms of service in relation to dental work. He contended that dental work was never meant to form part of insurance practitioners' duties as covered by the capitation fee. He cited the recognised allowance of extra payments for dental anæsthetics administered by insurance practitioners to patients on their lists. The Ministry's circulars, he believed, gave no specific authority for this allowance. The inference was that dental services were regarded as in a special category—like attendance at confinements. The medical service subcommittee's report, said Dr. X, seemed to make capital out of his admission that the service rendered by him was a medical service; but of course any service rendered by a doctor was a medical service; the administration of dental anæsthetics was a medical service and yet extra payment was allowed for it. The patient who had suffered from the dental hæmorrhage had written that she would naturally have applied for treatment to her dentist but for the fact that the time was midnight. This, said Dr. X, was an admission that she had merely made a convenience of the panel doctor. Responsibility for hæmorrhage following dental extractions rested primarily on the dentist who performed the operation. Medical intervention in such cases might be regarded as an act of courtesy for which the dentist might feel inclined to render the payment; or it might be deemed analogous to the now well-established routine adopted in emergency cases occurring on other doctors' lists. Dr. X recalled a recent resolution passed by the London panel committee recommending a solution of the problem on these lines.

The Minister of Health took the view that there should have been a formal reference to the local medical committee, but invited the observations of the committee on the point. In reply the committee relied on Clause 8 (1) of the terms of service, defining the treatment which a practitioner is required to

give to his patients: such treatment comprises all proper and necessary medical services other than those involving the application of special skill and experience of a degree or kind which general practitioners as a class cannot reasonably be expected to possess. Dr. X, said the committee, had never contended that his service in arresting the dental hæmorrhage was not medical service or that it involved special skill and experience beyond that of general practitioners as a class. The committee referred to the report of referees dated Sept. 10th, 1915, which dealt with similar facts. The report left no doubt that the arrest of hæmorrhage of the gums occurring seven hours after extraction was a medical service and one within the competence of the practitioner; the suggestion that it was the duty of the dentist to stop the bleeding was rejected as irrelevant; the failure in duty (if any) of one person was no excuse for the failure of another to perform his contract. "The bleeding at 11.30 in the night was a matter calling for the medical treatment which the practitioner was bound to give, and his obligations were in no way affected by the origin of the bleeding."

The decision of the Minister on the appeal (which was determined summarily) was as follows. The question whether the service rendered by Dr. X was within the scope of the obligations under the terms of service was ruled to be a matter to be dealt with, in the first instance, by the local medical committee in accordance with Article 43 of the Medical Benefit Regulations: in the circumstances, the findings and recommendation of the medical service subcommittee, and the decision of the insurance committee based on them, were held invalid. Dr. X therefore succeeded in his appeal. In conveying this decision, the Minister pointed out that the allowance of the appeal did not imply any decision on the scope of the service rendered by Dr. X. He gave no direction as to the costs of the appeal.

The result is inconclusive and unsatisfactory. The insurance committee is now referring the matter to the local medical committee under Article 46 of the Medical Benefit Rgeulations of last year, to obtain a decision as to the range of medical service—namely, whether the service rendered by Dr. X fell within the scope of his obligations or not. Meanwhile the proceedings have at least had the advantage of focusing attention, as Dr. X intended, on the relation of dental work to the medical practitioner's capitation fee.

CORRESPONDENCE

REST HOUSES FOR RHEUMATOID ARTHRITIS

To the Editor of THE LANCET

SIR,—I have read with great interest the leading article in your last issue entitled "Rheumatoid Arthritis: A Move On." It is time for a constructive national policy for the care and cure of those suffering from arthritis. I would submit that, if treatment centres are to be set up near the homes of the cases and special hospital provision made, the medical orthopædist should be a member of the organisation. This is not primarily for the purpose of dealing with the ordinary physical methods of treatment required, nor even for the prevention and cure of deformities. It is in order that methods of physical treatment may be organised which will build up the bodily resistance of the cases, by establishing correct use posturally of the body as a whole. Poor posture is almost always present in cases of chronic arthritis.

The group of symptoms called "arthritis" can be understood better when we look at them from the viewpoint of the student of "body mechanics," and realise the local and general functional disturbance which habitual bad posture can produce. Arthritis is not a disease of joints alone, but a widespread disorder of the whole body. Whatever the factors at work, the poor posture and lowered tone are parts of a vicious circle which must be broken. The atrophic form of arthritis is a degenerative disease much more common in women than in men. It occurs between the ages of 20 and 40, and almost always in the slender anatomic type of person. There is a profound failure of the body to do its work. With these conditions present, infection ultimately takes place. The background of inherited anatomic structure, prolonged visceroptosis, and poor posture result in progressive faulty function of the diaphragm, heart, lungs, and the misplaced abdominal viscera. The infection comes later when resistance is broken down. The longer the imbalance continues, the greater is the damage done.

Improvement of the bodily resistance cannot occur without prolonged rest and reconstructive treatment by skilled medical orthopædic care to correct the faulty bodily posture, to allow every organ of the body to do its work to full capacity. We must strive to obtain perfect and not imperfect use of the body in standing, sitting, walking, breathing, and in lying down. Without this part of the work, diet, rest, warmth, relief from strain, and the removal of infection cannot be expected to maintain a cure. They only lift a temporary burden.

The changes of arthritis can be prevented and checked if taken early and approached with these ætiological points in mind. I would submit that the medical orthopædic care of these cases is an art which is very little understood in this country. The problems of disturbed physiology of the organs, viscera, and nervous system within the abdomen do not differ essentially from an internal derangement of such a relatively simple structure as a joint. The same orthopædic principles, based upon a knowledge of anatomy and of right and wrong working conditions, apply equally to both. Arthritis is fundamentally an orthopædic problem in large measure. Physical resistance and bodily strength can be maintained or restored only by correct use and correct living.

Who is not familiar with the case of atrophic arthritis in which the chest is flat, the diaphragmatic excursion is practically absent, and the abdominal organs "dropped"? In some of the cases, so bad is the bodily mechanics, that it is hardly possible to insert a finger at the subcostal angle; and when one does so, it comes down at once upon the spine, so empty are the subdiaphragmatic spaces. With the loss of abdominal fat and the loss of the protection normally afforded by the properly positioned organs and viscera to the sympathetic nervous system in this situation, an inhibitory stretching results. With the consequent depression of all the vital functions and poor tone, it is essential for successful treatment that the medical orthopædic care of the case should proceed along with the purely medical care. Herein

lies the main province of the orthopædist, to assist in the establishment of right use of the body wherever and however it may have gone wrong.

I am, Sir, yours faithfully,

Edinburgh, Feb. 1st. W. A. COCHRANE.

To the Editor of THE LANCET

SIR,—I read with great interest your last week's leading article on the convalescent treatment of chronic arthritis in adults. For some years we have been treating cases of Still's disease at the Children's Heart Hospital (belonging to the Invalid Children's Aid Association) at West Wickham, Kent. The progress they have made in open-air country surroundings has been very satisfactory, and a great contrast to their lack of improvement whilst in city hospitals. I think that Dr. Fortescue Fox's suggestion should receive wide support, but those who undertake the supervision of such convalescent homes should realise that more than a few months' treatment will be necessary in many cases. Moreover, as Dr. Fox has emphasised in his scheme, facilities for physiotherapeutic treatment, skilled massage, and orthopædic measures to prevent contractures occurring, will be a necessary part of each establishment.

I am, Sir, yours faithfully,

BERNARD SCHLESINGER.

Portland-place, W., Feb. 1st.

To the Editor of THE LANCET

SIR,—In your leading article last week occurs the statement, "Dr. Fox himself attaches value to the use of pure sulphur waters in the treatment (of rheumatoid arthritis), and such waters are not available nearer than Wales, Ireland, or the north of Scotland." Presumably the word "pure" indicates virtual absence of chlorides, sulphates, &c., implying that sulphide is the characteristic ion. In this case the Harrogate springs, such as the Harlow, Beckwith, and Oakdale, are as fittingly placed in that category as those in the districts mentioned. Neither by road nor rail can Harrogate be termed remote. Although the strongly salinated waters founded Harrogate's reputation, the diversity of springs, due to the geological complexity of the underlying rocks, has given to medical hydrology a great variety of media.

I am, Sir, yours faithfully,

Harrogate, Feb. 1st. A. WOODMANSEY.

DERMATITIS AND MOTOR FUMES

To the Editor of THE LANCET

SIR,—Dr. Whitfield's note on dermatitis from motor fumes is of interest and indicates an obscure external cause for some cases of eczema of face and neck. In October, 1936, I saw a lorry-driver with marked irritation and variable dermatitis of face and neck in which I suspected fumes as a possible cause. As his work involved the loading of barley on to his lorry, I patch-tested him against petrol and barley. He gave a strong positive reaction to petrol, a negative reaction being obtained in other control subjects who were tested. I have little doubt that this was the explanation of his dermatitis which has persisted since he has not been able to change his work. I shall now try the effect of his driving with an open window in view of Dr. Whitfield's suggestion.

I am, Sir, yours faithfully,

Park-square, Leeds, Feb. 1st. JOHN T. INGRAM.

INFLUENZA AND LEUCOPENIA

To the Editor of THE LANCET

SIR,—The recent research work on the ætiology of influenza and numerous letters and articles lately in the medical press relevant to the symptomatology and treatment of this disease prompt me to call attention to an article published fifteen years ago in your columns (*Lancet* 1922, **1**, 116) by the late Dr. F. M. Gardner-Medwin and myself. Influenza in its present and recent form in this country is far from being the fatal disease which we know that it can at times become; it is very different now from the dreadful pandemic of 1918–19, but there can be no assurance that it may not yet again reassume the malignant form. A healthy dislike of anything suggesting commercialism and the pontifical utterances of many of our leading physicians have encouraged a non-possumus attitude in regard to treatment. We are told to fold our hands, to rely on rest in bed, warmth, and nursing, and to avoid any attempt to influence the course of the malady by any method of chemotherapy. This is doubtless good advice in regard to the treatment of the vast majority of cases of the present type; but I think it is to be regretted if it is to be applied invariably.

In 1918 and 1919, working at the 17th General Hospital in Alexandria, Gardner-Medwin and I came to the conclusion that influenza was due to a filtrable virus; that this caused a leucopenia which was an index of the inhibition of reactionary defence by the body; that the state of defencelessness thereby induced laid the host open to attack not only by the primary virus but by various germs—normally harmless, but potentially pathogenic—which are commonly to be found in the throat and upper respiratory tract; that prognosis depended on the number of circulating polymorphonuclear leucocytes (granulocytes), since the severity of the symptoms bore a direct relationship to the degree of leucopenia and recovery was always preceded and accompanied by a rise in the white blood count; and that *if* one could provoke such a leucocytosis—e.g., by the injection of such a drug as sodium nucleinate, the nucleotides not being known in those days—the disease was dramatically cut short and recovery ensued. It is not suggested that the granulocytes, per se, are necessarily the only defence mechanism, though I think that they are an integral part of it; and even then we inclined to the view that they were an index of the capacity of the host as a whole to respond to the infection by the production of antibodies against both virus and secondarily invading bacteria. In other words, we thought that the body itself could deal with the infection if only we could overcome the curious paralysing effect, on its defence forces, of the virus. Piney offered the ingenious explanation that the virus had a negative chemotactic effect on the leucocytes and that the nucleinate acted as a "chemotactic whistle" to call them out.

In the beginning we adopted a system of control by dividing the whole series of cases into two. The general treatment was the same in each but only those in alternate beds received the nucleinate. After a little while we found such a striking difference in the mortality-rate—those who received the nucleinate for the most part recovering and those who did not for the most part dying—that we did not feel justified in continuing to withhold it from the control cases. The only criterion was the presence of a leucopenia; naturally, in every case repeated blood counts were done to gauge the effect of the treatment. We observed two phases of the epidemic,

the first in the hot weather from July to October—when such things as "colds" in Egypt are unknown—and the second in the cold weather from the end of November, 1918, onwards. It is perhaps of significance that this period was marked by a degree of cold and wet which was most unusual for Egypt. In the first phase, the virus was evidently neurotropic, the illness causing fever, severe headache, generalised neuritic pains, and in some cases symptoms resembling an acute encephalitis. Lung complications were minimal, the disease was of short duration, although convalescence was marked by depression, and the mortality was practically nil. None of the people who contracted this influenza fell victims during the second phase, in which the onset of the disease was similar but was marked by the early onset of lung complications with an excessive mortality. The production of a leucocytosis by sodium nucleinate—the earlier, of course, the better—seemed to have a specific effect in saving life, especially in the heliotrope cases.

I should repeat that the drug appeared to have no effect unless a leucopenia was present, and unless it could provoke a leucocytosis. It was useless in cases of non-influenzal pneumonia where a leucocytosis was already present; and in the few cases under our care where there were, presumably, no leucocytes to call out owing to an aplastic condition of the hæmopoietic system. Cases of established leucopenia due to pernicious anæmia or long-continued severe malaria, for instance, showed no response. Reasoning by analogy I have since tried the drug in a few cases of distemper in dogs and in the very fatal "influenza" of cats. The results have been very encouraging, although, of course, I have not controlled these by blood counts and the number of cases treated is quite insufficient to allow of any definite conclusion being drawn from them. One word of warning. Not all preparations of sodium nucleinate provoke a leucocytosis in normal people; it follows that every batch must be tested on a volunteer (we always used ourselves) before reliance can be placed on it.

I fully realise that in venturing thus to suggest that the physician treating influenza may possibly be able to do more than supervise the nursing I am laying myself open to that very criticism which has been so unsparingly poured forth in the English medical press of late, reinforced as it has been by all sorts of clichés which may be summed up in the phrase "Dépêchez-vous de vous en servir de ce remède pendant qu'il guérit."

I am, Sir, yours faithfully,

Fleet, Hants, Jan. 28th. J. GRAHAM WILLMORE.

INTUBATION FOR PERFORATED GASTRIC ULCER

To the Editor of THE LANCET

SIR,—This method of dealing with perforated gastric ulcer, which was described in your issue of Jan. 23rd by Dr. Robert Leclercq, is certainly not a recent innovation. My colleague, the late Mr. W. G. Richardson of Newcastle-on-Tyne, practised this method many years ago and wrote a paper dealing with it (*Northumb. Durh. med. J.* 1907, p. 215). At the time of publication he had carried out this plan in a good many cases and it was so satisfactory that he continued to employ it during the rest of his professional career.

The title of his paper was "The Advantages of Temporary Gastrostomy in the Treatment of Ruptured Gastric and Duodenal Ulcer." This title perhaps suggests the formation of an independent gastrostomy, but, as a matter of fact, he actually passed the catheter into the stomach through the ruptured ulcer, and he was led to adopt that plan because of the very occasional difficulty of closing a perforation. At the same time he was so convinced of the advantages of the catheter in the stomach that he sometimes adopted this method even when it would have been possible to close the ulcer by suture.

Since my association with Mr. Richardson I have occasionally used the method for the same reasons which induced him to originally adopt it. But in quite a number of other instances I have made an independent gastrostomy even when it was possible to completely and safely close the perforation by suture. I have especially used gastrostomy in long-standing cases of perforations where there is infection of the upper small intestine area with distension and paresis of the upper coils, and also in cases in which the patient is suffering from dilated stomach as a result of marked pyloric stenosis, but in which it is not considered wise to carry out gastro-enterostomy because of the accompanying peritonitis. It is also valuable when the stomach is big and flabby.

I referred to this matter in a Hunterian lecture which I delivered before the Hunterian Society in January, 1925 (*Lancet*, 1925, **1**, 183). At that time I had operated for perforations on 147 occasions and I had employed a temporary gastrostomy 26 times. Among these 26 patients the mortality was 30 per cent., which is exceedingly high, but they were all examples of either long-standing perforation or of perforations complicated by the conditions which I have previously mentioned. In the series the average number of hours after perforation was no less than 17.

I am satisfied that such a gastrostomy is sometimes a very great aid in dealing with these cases. It acts as a safety valve. The stomach can be irrigated without inconvenience to the patient, distension can be relieved by simply removing the catheter plug, and since overdistension of the stomach is always under control the patient may have the satisfaction of drinking much more freely than would otherwise be advisable.

I am, Sir, yours faithfully,

G. GREY TURNER.

Hammersmith Hospital L.C.C., Ducane-road, W., Feb. 1st.

APPENDICITIS AND ALARM REACTION

To the Editor of THE LANCET

SIR,—Some of the pathologic-anatomical changes described by Dr. Hans Selye[1] under the name "alarm reaction" as the result of non-specific irritants, raise a strong suspicion of their pure vasomotor character; a possibility which is supported by older and more recent observations, apparently of the same order. Amongst the older observations are those by Rossbach[2] and by Aufrecht.[3] These demonstrated very clearly the direct effect of cold on distant parts of the body in the production of strong vasomotor reactions in trachea and lungs, showing themselves first in spastic anæmia followed by marked congestion, and even fibrinous and leucocytic exudates. The gastro-intestinal ulcerations, and the appendix lesions more particularly, of this alarm reaction are, as far as one may judge from the meagre anatomic-histological details, of similar neurovascular order.

[1] Acute Phlegmonous Appendicitis produced by Intravenous Administration of Histamine, *Lancet*, 1936, **2**, 1210.
[2] *Berl. klin. Wschr.* 1882.
[3] *Dtsch. Arch. klin. Med.* 1916, **119**, 270.

In the gut these ulcerations resemble those multiple forms which appear in uræmia, metallic poisonings (mercury), and in infections. These intestinal ulcerations are now generally accepted by pathological anatomists as the result of necroses from blood stasis in paralysed terminal vascular segments (infarcts).

Space does not permit further expositions, but those interested may be referred to G. Ricker [4] and E. Kaufmann.[5] As regards appendicitis on such a neurovascular basis, Ricker's article on "epityphlitis" [6] is noteworthy. He puts first in the appendix attack an abnormal irritation of its nervous system and also that infection arises secondarily on the basis of the exudative and necrotic primary neurovascular changes. He regards the appendix lesion as the "akron" of a general splanchnic increased irritability. A review of this matter may also be found in the section on appendicitis by Christeller and Mayer, in the Henke-Lubarsch Handbuch (vol. 104, p. 536).

Finally, an experimental study by E. Reinhardt and Ricker,[7] entitled a Critique of the Doctrine of Cellular and Humoral Stimulation of the Cutaneous Circulation, devotes some attention to the "histamine factor" (the fashionable substance which at present seems to be brought into relation to all the ills the human kind may be subject to) and points out the scientific and epistemological weakness of such a purely biochemic explanation of living events.

Perhaps your readers will be interested in obtaining these additional references.

I am, Sir, yours faithfully,

HORST OERTEL.

Pathological Institute, McGill University, Jan. 20th.

A BILL TO SECURE MEDICAL PRIVILEGE

To the Editor of THE LANCET

SIR,—Having won an early place in the Ballot for Bills, I have been allotted a time next Friday, Feb. 5th, to introduce a Bill, and I am taking this opportunity of presenting a measure to secure privilege under certain conditions from disclosure of communications made to medical practitioners by their patients under the seal of confidence. I append the text of the Bill as it is printed and as I propose to present it. I may say that some of the clauses, especially those relating to the prevention of crime or fraud, have been drafted for me by Lord Atkin, who has publicly stated his opinion that some measure of professional protection should be afforded to medical practitioners as it is to, e.g., solicitors.

In November, 1927, I obtained under the Ten Minutes Rule a first reading for a Bill in essentially the same terms as my present Bill with the exception that in the earlier Bill I was advised by legal members in the House to limit the operation of the Bill to cases of venereal disease, that limitation being suggested by the fact that patients attending venereal clinics under the ægis of the Ministry of Health are assured upon coming to the clinics by leaflet and personal promises that their confidences will be respected. This protection was found to be illusory some short time before I brought forward the early Bill, and several legal members of the House assured me at the time that they agreed with the Bill as it then stood, indeed a number of eminent lawyers [8] gave the support of their names on the back of my Bill. I did not proceed further with the early Bill as inquiries convinced me that even if the Bill passed the Commons the Lords, led by Lord Birkenhead, would reject it. I believe there will be less opposition now from legal members of both Houses, and this belief as well as another consideration have weighed with me in making my new Bill of wider application. The drawback of limiting the Bill to venereal diseases is obvious, in that any person pleading its protection in a court of law would by implication be liable to the imputation that he was suffering from venereal disease.

At the ninth International Congress of Dermatology held in Budapest in 1935, when I was president of one of the six committees appointed by the congress, the purpose of my committee being the consideration of medical problems affecting public interests, I chose as one of the subjects of my committee the discussion of the degree of protection awarded to the "professional secret" in those countries represented upon the committee, which included members from nearly every State in Europe and from the United States. It became obvious that the protection given to the "professional secret" abroad was much more efficient than in our own courts, and no miscarriage of justice from this protection was recorded by the various speakers. That widely distributed experience should dispel any fears entertained by the lawyers in our country that the protection afforded by my Bill, safeguarded as it is from improper use, would be followed by untoward results.

I am, Sir, yours faithfully,

House of Commons, Feb. 1st. E. GRAHAM-LITTLE.

ENCLOSURE

Medical Practitioners' Communications Privilege — 5th February 1937.

A BILL

TO

Provide that certain communications between medical practitioners and their patients shall be privileged from disclosure in evidence.

BE it enacted by the King's Most Excellent Majesty, by and with the advice and consent of the Lords Spiritual and Temporal, and Commons, in this present Parliament assembled, and by the authority of the same, as follows:—

1. Any information obtained by a duly registered medical practitioner in the course of treatment of any patient shall be regarded as confidential, and shall be privileged from disclosure in a court of law: — Privilege from disclosure in courts of law.

Provided that the information obtained shall have been obtained for the purpose of a cure, or assisting in a cure, of a person so treated:

And provided also that this privilege (*a*) shall not extend to any communication made with the object of committing or aiding in committing any fraud or crime; and (*b*) shall not extend to any disclosure in any court of law in any case founded on a criminal charge or charge of fraud against such patient.

2. For the purpose of this Act "duly registered medical practitioner" shall mean a person whose name is on the "Medical Register." — Definition.

3. This Act may be cited as the Medical Practitioners' Communications Privilege Act, 1937. — Short title.

[4] Relationspathologie, Berlin, 1924, pp. 118 and 119.
[5] Lehrbuch der speziellen pathologischen Anatomie. 1931, vol. i., p. 716.
[6] *Dtsch. Z. Chir.* 1927, **202**, 125.
[7] *Virchows Arch.* 1933, **288**, 393.
[8] These were Sir Walter Greaves-Lord, K.C., Mr., now Sir F. Boyd Merriman, K.C., Mr. R. Hopkin-Morris, Mr. Goodman Roberts, Mr. R. Storry-Deans, K.C.

DYSOSTOSIS CRANIOFACIALIS

To the Editor of THE LANCET

SIR,—A case of craniofacial dysostosis is reported by Prof. A. J. Ballantyne in the January issue of the *Proceedings of the Royal Society of Medicine*. He suggests that the cause of this condition is quite unknown, and although this is true I should like to draw attention to a theory which I published in the *Journal of Neurology and Psychopathology* (June, 1934). This theory was that the synostosis which is so evident and which is the apparent cause of the distortion is due to some condition which prevents the brain growing normally, and which inhibits various areas. If I may quote from my paper:

"It has been admitted since the failure of operative measures in microcephaly that the growth of the skull is dependent on the growth of the brain. In microcephaly the brain does not grow to the usual size and the skull shapes itself to conform to it. Again in porencephaly the skull is often flattened over the undeveloped half of the brain. It will therefore appear probable that any deformity of the skull is the result of cerebral disease and not of disease of the bones or sutures. For some unknown reason the fœtal brain does not develop at the normal rate and in normal directions. Possibly the brain even stops growing for a time. This uneven development allows the sutures to fuse where they are in contact."

This theory explains all these conditions of cranial deformity. In my paper I suggested that whether oxycephaly, hypertelorism, craniofacial dysostosis trigonocephaly, or any other member of the group is produced will depend on which part of the brain s sluggis h in its growth. If it is mainly the frontal lobes which are affected, so that the coronal sutures are allowed to fuse, the brain will find itself forced to enlarge the skull upwards, producing oxycephaly. If the parietal lobes are at fault scaphocephaly is produced. Hypertelorism and cranio-facial dysostosis appear dependent on disproportionate growth of the occipital, and possibly other lobes (this may explain the abrupt occiput in hypertelorism).

I agree that a general title is necessary but I would suggest that of cephalic dysostosis should be used (instead of the one suggested by Prof. Ballantyne, which has so far been limited to Crouzon's disease).

I am, Sir, yours faithfully,

Harley-street, W., Jan. 26th. CLIFFORD ALLEN.

RADIOGRAM AND RADIOGRAPH

To the Editor of THE LANCET

SIR,—Permit me to contribute the following additional observations in support of the noun *radiograph*.

Prof. Oliver Lodge probably coined this word, for it was the name he gave to the photographs taken by the new Roentgen rays which he used to illustrate his paper at Liverpool on March 26th, 1896, and it is recorded in the *British Medical Journal* of April 4th, 1896. This association many of us would like to preserve for obvious reasons. I cannot find as early a reference to *radiogram*.

In your comment on my quoting *photograph* as precedent you state that this is really an unlucky exception to a convenient rule. There is more in my suggestion than similarity of the objects and their processing. Prof. Arthur Schuster, making the earliest British reference to Roentgen's discovery (*British Medical Journal*, Jan. 18th, 1896), called the radiographs which Roentgen had sent him *photographs*, and in the same journal (Jan. 25th) will be seen a radiograph of the hand with a note: "It is a photograph of his own hand taken by means of the new radiation discovered by Professor Roentgen."

The terms *Roentgen photograph* and *X ray photograph* are still to-day in use. The nouns *skiogram* and *shadograph* appeared in the *British Medical Journal* for Feb. 22nd, 1896, and Sidney Rowland used the nouns *skiagram* and *skiagraph* in his serial articles there during March and April, 1896; but the term *skiascopy* was applied to the shadow test in refraction before Roentgen's discovery and to wrest it from its original setting does not appear praiseworthy.

Your comment, "Our preference for *radiogram* is based on the analogy of *telegraph* and *telegram* . . . *telegram* was devised to signify what was written by the telegraph." Surely this lends support to the use of *radiogram* for the wireless message? But there are Greek scholars (see *British Journal of Radiology*, March, 1927, p. 115) who say that "telegram is the vilest abomination ever popularised. It is an impossible compound. The true Greek form would be Telegraphene. A telegraph would be better. . . . Skiagram is an impossible compound violating every rule of Greek formations."

I have been at some pains to go through the contributions to the *British Journal of Radiology* for the past six years and the following is an analysis of the terms employed, each contribution having but one score:—

Radiograph	131	X rays	6
Radiogram	56	X ray photograph ..	8
Skiagram	30	X ray pictures	6
Skiagraph	3		

One may say that the term *radiograph* is used exclusively for the photograph taken by X rays, and its continued use by a large section of the profession and the public is not likely to lead to any confusion; whereas, whether we like it or not, the term *radiogram* is now the household word for a radiogramophone and not likely to be supplanted.

I am, Sir, yours faithfully,

Birmingham, 15, Feb. 1st. JAMES F. BRAILSFORD.

To the Editor of THE LANCET

SIR,—*Radiogram* and *radiograph* are both ill-bred and bastard words, and it is difficult to know which to legitimise by official adoption as the term for an X ray picture. The mixed Latin and Greek parentage is avoided in the terms *skiagram* and *skiagraph*, but they are somewhat archaic in sound, as is pointed out in "Radiogrammarian's" letter (a pseudonym, be it noted, also with a bar sinister!), and strictly they mean *shadow-picture*, the negative of *photograph* or *light-picture*. It seems that although of blue blood, they are in the category of lost causes, and that the battle will rage round the first two words.

In the word *radiograph* the suffix *-graph* may be regarded by some as derived from the Greek verb "graphein" to write, in which case the word becomes a verb, denoting the act of taking an X ray picture, a sense in which it is used by the majority of radiologists. On the other hand those who use *radiograph* as a substantive may claim that its suffix is then derived from the rare Greek noun "*graphē*," meaning a picture or painting. The objection to this is that "*graphē*" is never used in Greek in a compound word. An alternative derivation of *-graph* in the substantive might be "*grapheia*," the Greek abstract noun, but this would be properly translated *-graphy*.

Those who, like myself, use *radiogram* as the noun, are on safe ground in the respect that "*gramma*" (a letter, or thing written) is often employed in com-

pound words (cf. anagram, diagram, epigram), and the objection to it lies only in its literal meaning—i.e., a thing written by a ray. In defence of this inaccuracy, may I suggest that the important element in an X ray picture is not its pictorial effect, or "*graphē*," but its message or *gramma* (pace those who do not read radiologists' reports), and that the secondary meaning justifies its adoption as a noun in preference to *radiograph*.

Other advantages of *radiogram* are, as "Radiogrammarian" has pointed out, euphonic and practical. It is somehow tidier to have different words for the noun and the verb. Again, do the advocates of *radiograph* propose to talk of *cholecystograph* or *pyelograph?* I confess they come awkwardly to the tongue.

The piracy of the wireless and gramophone interests are, to my mind, a further incentive to hold fast to the word coined first in radiology. As for *röntgenogram* or *röntgenograph*, the sound of them is enough! I would almost as soon use *augeograph* or *radiopict*, both of which at least have parents of the same stock.

Finally, is *X-ray* really spelt without a hyphen?

I am, Sir, yours faithfully,

Harley-street, W., Feb. 2nd. S. COCHRANE SHANKS.

NASAL SINUSITIS IN CHILDHOOD

To the Editor of THE LANCET

SIR,—There is no doubt that chronic antral infection is often overlooked both in children and adults, and there is not necessarily any fluid to be found in the infected antrum. In fact the dry antrum with the infected membrane is a greater cause of trouble than where there is fluid in it. Where a few antrum punctures and wash-outs do not cure the infection an intranasal opening should be made so that daily lavage of the cavity can be done. If the antrum recovers, frequently the other cells do also.

I am, Sir, yours faithfully,

C. HAMBLEN THOMAS.

Harley-street, W., Jan. 30th.

WHEN WAS JOHN HUNTER BORN?

To the Editor of THE LANCET

SIR,—The approaching anniversary of John Hunter's birth recalls the various dates that have been given by various people for that event. These number at least four.

(1) July 14th, 1728. This is the date given by Sir Everard Home in his memoir of Hunter's Life prefaced to Hunter's treatise on the blood, inflammation, and gunshot wounds. In a copy of this work in the Royal College of Surgeons library is a marginal correction to February in William Clift's beautiful handwriting.

I believe, but have not the reference by me, that Sir E. Home himself subsequently corrected the error, but without, so far as I know, explaining how he came to make the mistake. It is surprising that so gross an error should have been made by one who was Hunter's resident pupil, assistant, locum tenens, successor, brother-in-law, and executor under his will.

(2) Feb. 7th, 1728. This is a written entry on the fly-leaf of a small bible presented to the Royal College of Surgeons by the late Miss Helen Baillie. The entry records the marriage of Hunter's parents, the years (and in some instances the dates) of the births and deaths of all their children. John's death alone is wanting.

(3) Feb. 13th, 1728. In the appendix to Dr. Adams's memoir a letter to the author from the minister of East Kilbride is quoted. It says that this date is that given in the baptismal register of the parish of East Kilbride, and that he was baptised on March 30th. It adds that Hunter's mother's name is entered as—Paul.

Paul was the lady's unmarried surname. Her Christian name was Agnes. It is plain that the informant did not know her Christian name, and therefore was not Hunter's father.

(4) Feb. 14th, 1728. Ottley, in his "Life," prefaced to Palmer's edition of Hunter's works, says that Hunter himself used to date his birth on this day, which consequently is that on which his anniversary is celebrated at the College of Surgeons.

Hunter's evidence can only be hearsay, despite the fact that he was a principal party and present on the occasion. On the whole it seems most probable that he was born on the night of Feb. 13th–14th, 1728, about midnight, and that the exact time was not observed by any of those present at the birth.

I am, Sir, yours faithfully,

R. K. HOWAT.

Southampton-row, London, W.C., Feb. 1st.

B.M.A. AND T.U.C.

SOME time ago Sir Walter Citrine, secretary of the Trades Union Congress, approached the council of the British Medical Association with a proposal for a working link between the trade-union movement and the medical profession, and suggesting a standing joint committee to deal with subjects on which coöperation would be advisable. The settlement of the dispute at Llanelly paved the way for some arrangement of this kind and the appointment of a joint committee has now been announced as follows:

For the B.M.A.: Sir E. K. Le Fleming (chairman of council), Sir Henry Brackenbury, Dr. H. G. Dain, Prof. R. M. F. Picken, Dr. J. W. Bone, Dr. H. W. Pooler, and Dr. G. C. Anderson (medical secretary).

For the T.U.C.: Mr. Ernest Bevin, Sir Walter Citrine, Mr. A. Hayday, M.P. (chairman of the Social Insurance Committee), Mr. W. Kean (chairman of the Workmen's Compensation and Factories Committee), Dr. A. Welply and Dr. E. A. Gregg (Medical Practitioners' Union), and Dr. H. B. Morgan (medical adviser to the T.U.C.).

This joint committee will meet alternately at the house of the B.M.A. and the T.U.C., the chairman to be drawn alternately from either side. The joint secretaries of the committee are Dr. Charles Hill for the B.M.A., and Mr. J. L. Smyth for the T.U.C.

ROYAL EYE HOSPITAL, SOUTHWARK.—Sir John Simon was the principal guest at the Coronation dinner held in aid of this hospital on Jan. 22nd, when subscriptions amounting to nearly £2000 were received. The hospital in 79 years has dealt with over a million patients, and is the only London eye hospital south of the Thames, though there are four on the north bank. Over 7000 cases of industrial eye injury were treated last year.

NEUROSURGERY AT EDINBURGH ROYAL INFIRMARY.—At a recent meeting of the court of contributors to the Royal Infirmary of Edinburgh reference was made to the accommodation of fee-paying patients in the neurosurgical ward. The managers of the infirmary have not previously made any provision for fee-paying patients; but it was pointed out at the meeting that the circumstances are peculiar, in that neurological surgeons require a special team of trained assistants and nurses and it is impracticable for the neurological surgeon to have one such team in the hospital and another outside in a nursing-home. Ward 20 is in the process of being reconstructed as a ward for neurosurgical patients, who are at present scattered throughout the hospital.

NEW YEAR HONOURS

THE delayed list issued on Monday contains the names of the following members of the medical and dental professions:—

G.C.S.I.

H.H. the Maharaja of Gondal., G.C.I.E., M.D., F.R.C.P.E., F.R.S.E., LL.D.

K.C.V.O.

John Fraser, M.C., F.R.C.S.E.
Regius professor of clinical surgery in the University of Edinburgh.

Knights Bachelor

Joseph Arthur Arkwright, F.R.C.P., F.R.S.
Member of the Agricultural Research Council.

John Charles Grant Ledingham, C.M.G., D.Sc., F.R.C.P., F.R.S.
Director of the Lister Institute; professor of bacteriology in the University of London.

Ernest Kaye Le Fleming, M.D.
Chairman of the council of the British Medical Association.

John Henry Morris-Jones, M.C., L.R.C.P., J.P.
M.P. for Denbigh; Lord Commissioner of H.M. Treasury.

C.B. (Military)

Major-General T. S. Coates, O.B.E., M.B., K.H.P.
Deputy director of medical services, Aldershot Command.

Major-General A. W. M. Harvey, M.B., K.H.S., I.M.S.
Deputy director of medical services, Northern Command, India.

C.M.G.

William Henry Kauntze, M.B.E., M.D.
Director of medical services, Uganda Protectorate.

C.I.E.

Lieut.-Colonel R. E. Flowerdew, M.B., I.M.S.
Inspector-general of prisons, Bengal.

Graham Colville Ramsay, O.B.E., M.D.
Deputy director of the Ross Institute (London School of Hygiene and Tropical Medicine).

C.B.E. (Military)

Surgeon Captain W. J. Carr, M.R.C.S.
Director of medical services, Royal Australian Navy.

Surgeon Captain (D) Edward Ernest Fletcher, O.B.E., L.D.S., R.N.

C.B.E. (Civil)

Percival Alfred Dingle, M.R.C.S.
Principal medical officer, North Borneo.

O.B.E. (Military)

Lieut.-Colonel G. B. Hanna, L.R.C.P., I.M.S.
Officer commanding the Indian Military Hospital, Quetta, India.

O.B.E. (Civil)

George Moncrieff Barron, F.R.A.C.S.
Member of the council of the New South Wales branch of the British Medical Association.

Sydney Letts Dawkins, M.B.
Medical officer, South Australian Railways.

Lieut. W. S. Empey, M.B., I.M.S.
Recently leader of the British Ambulance Unit No. 1 in Ethiopia.

Bernard Hart, L.M.S.S.A.
Consulting radiologist, Doncaster Royal Infirmary.

Victor William Tighe McGusty, M.B.
Secretary for Indian affairs and inspecting medical officer, Fiji.

William Egbert Thompson, M.B.
Surgeon specialist, Palestine.

M.B.E. (Civil)

Manikkam Durairaj David, F.R.C.S.E.
Third surgeon, General Hospital, Rangoon; police surgeon, Rangoon.

Kaisar-i-Hind Medal (Bar)

Louisa Helena Hart, M.D.
Medical missionary, Chittoor district, Madras.

Kaisar-i-Hind Medal

Lieut.-Colonel G. M. Millar, O.B.E., M.B., I.M.S. (retd.)
Director of medical services, Jammu and Kashmir State.

THE SERVICES

ROYAL NAVAL MEDICAL SERVICE

Surg. Comdrs. M. S. Moore to *St. Vincent*; F. St. B. Wickham, O.B.E., to *Victory* for R.N.B.; and G. S. Rutherford to R.N. Hosp., Great Yarmouth.

Surg. Lt.-Comdr. R. B. McVicker to be Surg. Comdr.

Surg. Lt.-Comdrs. E. R. P. Williams and D. F. Walsh to *President* for course.

Surg. Lts. J. M. Reese and S. K. Foster to be Surg. Lt.-Comdrs.

Surg. Lt. (D) J. C. Benson to be Surg. Lt.-Comdr. (D).

Surg. Lts. B. M. Goldsworthy to *St. Vincent*; and E. J. Littledale to *President* for course.

Mr. A. Eckford of Boston, Lincs, has been appointed Admiralty Surgeon and Agent for Boston; Mr. J. Ashforth of Doncaster, for Doncaster; Mr. A. MacQuarrie of Brightlingsea, for Brightlingsea; and Mr. R. A. Walker of Peterborough, for Peterborough.

ROYAL NAVAL VOLUNTEER RESERVE

Surg. Lt. (D) L. B. Hilton to *Drake* for R.N.B.

ROYAL ARMY MEDICAL CORPS

The undermentioned Capts. to be Majs.: E. H. Hall, G. A. Walmsley, A. Sachs, R. T. P. Tweedy, T. E. Moles, W. R. C. Spicer, G. T. L. Archer, and M. R. Burke.

Short Service Commissions: Lt. (on prob.) A. F. H. Keatinge is restd. to the estabt.

TERRITORIAL ARMY

Lt.-Col. E. L. Sandiland, T.D., vacates the appt. of O.C., 170th (Cavalry) Fd. Amb., on completion of tenure.

Lt.-Col. E. L. Sandiland, T.D., to be Bt. Col.

Maj. D. Stewart, T.D., to be Lt.-Col. and to comd. 170th (Cav.) Fd. Amb.

Lt. H. Weir to be Capt.

J. McG. Rogan (late Cadet Lce.-Corpl., Royal High Sch. Contgt., Jun. Div., O.T.C.) to be Lt.

J. C. Lindsay to be Lt.

ROYAL AIR FORCE

Wing Comdr. W. J. G. Walker to R.A.F. Station, Halton, for duty as Senior Medical Officer.

Squadron Leaders A. Harvey to Directorate of Medical Services, Air Ministry, for staff duties; B. W. Cross to Aircraft Depôt, Hinaidi, Iraq, for duty as Senior Medical Officer, Iraq Levies and Officer Commanding Levy Hosp., Hinaidi; L. I. Hyder to R.A.F. Station, Heliopolis, Egypt, for duty as Medical Officer; and F. L. White to Headquarters, Bomber Command, Uxbridge, for duty as Medical Officer.

Flight Lts. J. F. Ziegler to R.A.F. Station, Calshot; D. A. Wilson to R.A.F. Hosp., Cranwell; and E. Donovan to R.A.F. Station, Hemswell.

Flying Offrs.: The undermentioned are posted to the Medical Training Depôt, Halton, on appointment to short

service commissions: W. T. Buckle, D. F. Cameron, H. O'B. Howat, J. H. Lewis, J. D. Milne, S. Paul, E. S. Sidney, and J. C. Taylor.

Dental Branch.—Flying Offr. J. H. G. Fensom to R.A.F. Station, Odiham.

INDIAN MEDICAL SERVICE

Lt.-Col. F. W. Hay retires.

Maj. N. M. P. Dotivala to be Lt.-Col.

Lts. (on prob.) to be Capts. (on prob.): V. D. Gordon, B. de Burca, D. R. Nicol, J. Morgan, G. R. C. Palmer, A. C. Taylor, J. Revans, T. Sommerville, and L. M. Kelly.

DEATHS IN THE SERVICES

Colonel HAROLD HAY THORBURN, C.I.E., I.M.S., whose death occurred on Jan. 27th at Peshawar, N.W.F.P., was the second son of the late Mr. J. Hay Thorburn of Park Lodge, Eltham. Born in December 1882, he was educated at Edinburgh University, qualifying M.B., Ch.B. in 1906. In September of that year he joined the I.M.S. and was in military employ on the N.W. Frontier till April, 1911. He then became civil surgeon to the Khyber Agency, later at Peshawar and Wano. In 1913 he was agency surgeon at Meshed, Persia. During the European war he was instrumental in raising and commanded Hazara levies to prevent armed parties of enemy emissaries entering Afghanistan from Persia. He accompanied the column to Isfahan and Shiraz where he did single-handed the work of the H.Q. office for several months until the arrival of seven staff officers. In 1920 he was civil surgeon at Hazara and residency surgeon and C.M.O. Baluchistan. In 1924 he was legation surgeon at Kabul and after becoming lieut.-colonel was appointed surgeon to the Viceroy of India in 1927. In June, 1917, he was created C.I.E., and he was decorated by the King of Afghanistan.

(For New Year Honours in the Services consult the previous page.)

OBITUARY

HENRY ALEXANDER OSBORN, D.M. Oxon.

As we announced last week Dr. Osborn died on Jan. 23rd from a hæmic infection contracted at a post-mortem examination. He was pathologist at the Mill-road Infirmary and other Liverpool hospitals.

Graduating in arts at Natal University College in 1914, Osborn was awarded a Rhodes scholarship. War service in East Africa intervened, however, until he was invalided out of the Army in 1917 with malaria. On his recovery he proceeded to New College, Oxford, and in 1919 went on to King's College Hospital with a scholarship in pathology. He qualified in 1921, graduated at Oxford in 1922, and took the D.P.H. During 1923 and 1924 he held a pathological appointment at King's College Hospital, and from 1924 to 1932 he was pathologist in the Laboratories of Pathology and Public Health in Harley-street. During this period he became pathologist to King Edward Memorial Hospital, Ealing, and consulting pathologist to Wembley Hospital. In 1932 he was appointed to the newly created post of pathologist to the southern group of municipal hospitals in Liverpool—Mill-road Infirmary, Smithdown-road Hospital, and Alder Hey Children's Hospital—with a total of 3000 hospital beds.

He took up the task at a time of rapid development of these hospitals, shortly after they were taken over from the old guardians by the municipality. It needed energy, insight, and powers of organisation, for both clinical and pathological work was increasing at almost breakneck speed. "Indeed," writes a medical friend, "those of us who were his clinical colleagues look back upon the past five years and wonder how he was able to encompass so much. For the routine clinical pathology of the hospitals was so smoothly and adequately done, that it was not until after his death that we became fully aware of just how much personal attention he gave to it. He had succeeded so well that we almost came to take his accomplishment for granted. Moreover, he found time and energy to carry out research on problems in the wards which forced themselves on the attention of an alert mind. Troublesome outbreaks of pemphigus in the maternity department led to work on neonatal dermatitis, for which he was awarded the D.M. Oxon. The admission of large numbers of patients suffering from pneumonia stimulated him to an intensive study of the disease, in collaboration with clinicians, and he was especially fascinated by what he used to term the 'ecological factors' in prognosis—the importance of 'the soil,' and especially of undernutrition. Certain types of neonatal death also aroused his thoughtful curiosity, and much occupied his mind in more recent months.

"Osborn was an ideal clinical pathologist, spending his time between wards, laboratory, and post-mortem room, integrating pathology with clinical work, to the advantage of patients and colleagues alike. He was always ready and indeed eager for consultation at the bedside, on a difficult or interesting case; and he himself, in turn, was anxious always to have the clinician present at the many autopsies which he performed, for a proper and equal interchange of facts and ideas. He was a strong, quiet, and unruffled personality; his accuracy of mind and attention to detail were qualities, therefore, which served him well, yet never got out of proportion. He talked slowly and deliberately; he would listen in silence, with a tolerant smile, to intervene at last with some direct critical or thoughtful remark which was all the more effective for being so quietly uttered. There was no cynicism about him; he was kind, practical, and ready to say honestly and directly what he had to say.

"Among the memories of our collaboration in hospital there are two which recall Osborn to me as man and friend—the days when in the hospital common-room he sat, relaxing over a cup of tea, puffing at his pipe, and discussing with his colleagues things medical or otherwise, with flashes of an almost pawky humour; and the enthusiasm with which even in his laboratory at Liverpool he tried to initiate me into the joys of surf-bathing in one of his beloved Cornwall coves."

RESEARCH IN DISEASES OF THE BLOOD.—The trustees of the Lady Tata memorial fund invite applications for grants and scholarships for research in diseases of the blood, with special reference to leukæmia, in the academic year beginning on Oct. 1st. Grants of variable amount are made for research expenses or to provide scientific assistants to senior workers. Scholarships are awarded as personal remuneration, and they ordinarily have the value of £400 per annum for whole-time research, with proportionate adjustment for work on a part-time basis where this is approved. The grants and scholarships are open to workers of any nationality. Applications must be submitted before March 31st, and the awards will be made by the trustees in June. Further particulars and forms of application may be obtained by writing to the secretary of the scientific advisory committee, 138, Bedford Court-mansions, London, W.C.1.

PARLIAMENTARY INTELLIGENCE

FACTORIES BILL

IN the House of Commons on Friday, Jan. 29th, Sir JOHN SIMON, Home Secretary, introduced the Factories Bill, the purpose of which is to consolidate with amendments the Factory and Workshop Acts, 1901 to 1929, and other enactments relating to factories. The Bill, which was read a first time, is not only a consolidating measure, it is a revising measure which will bring the provisions of the Factory Acts up to date. The main changes proposed are as follows:—

The various distinctions which exist in the present law between factories and workshops and between textile and non-textile factories are abolished, and only one term "factories" is employed.

Part I, which deals with general provisions as to health, strengthens existing provisions and introduces new proposals. The requirements as to cleanliness are made more precise. The amount of cubic space required per person is increased from 250 cubic feet to 400 cubic feet; but in existing workrooms the old standard will continue to apply for five years and longer if effective mechanical ventilation is provided. A reasonable temperature in all workrooms and a special standard of temperature for light sedentary work prescribed by the Secretary of State are to be maintained, and the Secretary of State will also have power to prohibit the use of unsuitable methods of heating. Important new proposals are those for securing sufficient and suitable lighting and for medical supervision of the workers in certain circumstances—e.g., in outbreaks of disease.

In Part II the provisions of the existing law have been largely re-cast. New proposals provide for the adoption of various safety devices or arrangements; and impose duties on manufacturers in regard to the construction of new machines. Precautions are required in the case of cranes, chains, steam receivers and containers, compressed air receivers, processes involving risk of explosion from dust or fumes, and various other matters. Specific requirements are laid down with regard to hoists and lifts. The provisions in regard to means of escape in case of fire, for giving warning and for familiarising employees with the routine to be followed, are considerably extended so as to cover all factories in which more than 20 persons are employed, or where explosive or highly inflammable materials are stored or used. Part III deals with general provisions as to welfare, especially drinking water, washing facilities, and accommodation for clothing and facilities for sitting for female workers. Part IV contains important new proposals in regard to health, safety, and welfare: these concern chiefly the removal of dust, the control of underground workrooms, and the lifting of excessive weights, giving power to make regulations prescribing maximum weights for young persons and men and women. Part V reproduces substantially the existing law relating to the notification and investigation of industrial accidents and diseases. Part VI deals with the hours of employment of women and young persons. At present women and young persons may work in any week up to a maximum of 60 hours in non-textile (55½ in textile) works, exclusive of intervals for meals, and women may do a limited amount of overtime in certain trades. Under this Bill working hours shall not exceed 48 weekly and 9 daily, exclusive of intervals for meals; an aggregate of 100 hours overtime in the year will be allowed for women and young persons over 16, but not more than 6 hours in any week or during more than 30 weeks in the year. In trades subject to seasonal or other pressure, however, women may be allowed to work 150 hours overtime and the other overtime requirements may also be released "in proper cases." Young persons under 16 will not be allowed to work overtime, and provision is also made for reducing the amount of overtime for those over 16 in any process in which overtime employment is shown to be prejudicial to their health. The same Part also provides for certain exceptions to meet certain special cases.

Part VII following the existing Act applies certain provisions of the Act to docks, wharves, quays, and warehouses; it also applies certain provisions to certain processes carried on in ships in a harbour or wet dock which are not at present under the Act; to building operations which are only partly within the Act and to works of engineering construction which now come within the scope of the Act for the first time. Parts VIII and IX re-enact the existing provisions in regard to homework and the supply of particulars to piece workers. Part X continues with modifications a number of existing miscellaneous provisions, but contains one new provision imposing specific obligations on employed persons requiring them to use the appliances provided for their health or safety and not wilfully or without reasonable cause to do anything likely to endanger themselves or others. Part XI contains the administrative provisions relating to the appointment, powers, and duties of inspectors and the appointment and duties of examining surgeons (the new name for the certifying surgeon). Part XII re-enacts with modifications the provisions with regard to offences and penalties and legal proceedings. Parts XIII and XIV deal with the application of the Act and general interpretation, and the definition of "factory."

It is proposed that the Bill shall come into force on July 1st, 1938, but the Secretary of State is given power to postpone, up to Jan. 1st, 1940, the operation of any particular provision in Part II. This would enable special treatment to be given if necessary to any depressed industry which might find it specially difficult to comply with the provisions in question.

MATERNITY SERVICES IN SCOTLAND

In the House of Commons on Jan. 28th Mr. ELLIOT, Secretary of State for Scotland, moved the second reading of the Maternity Services (Scotland) Bill. In 1935, he said, a report was issued on maternal morbidity and mortality in Scotland by a specially appointed and highly competent technical subcommittee of the Advisory Committee of the Department of Health for Scotland, who were convinced of the urgent need for improvement in the standard of midwifery in Scotland. This Bill closely followed the recommendations of this report. Its object was to improve the standard of domiciliary midwifery by securing adequate nursing and medical services for women confined in their own homes. A death-rate of six mothers for every 1000 children born in Scotland indicated a degree of ill-health which could not properly be measured, and some of these lives could be saved and much ill-health prevented by properly coördinated arrangements for attending to the health of women before, during, and after confinement in their own homes. The Bill differed from the one in England because of the different conditions in Scotland where the doctor played a larger part and the midwife a correspondingly smaller part in the confinement. Every expectant mother confined in her own home would be entitled to the services not only of a midwife but also of a doctor and if necessary an obstetrician of recognised standing. These would work together as a team under the general administration and guidance of the medical officer of health. Since the Scottish practice was for the confinement to be attended by a doctor, it was hoped that with the arrangements of the midwife service and the advice of highly qualified specialists at call the doctor would not be required to go beyond minor assistance in the confinement, which was a natural event which he should supervise and guide, if necessary, but in which the patient was certainly going to play by far the major part.

ORGANISATION AND FINANCE

The arrangements that the local authorities would require to make for providing this service, Mr. Elliot went on, would be subject to the approval of the Department of Health, but there would, of course, be some elasticity because such areas as the Highlands and Islands had difficulties in communications which would have to be taken into account. It would be open to the local authorities to negotiate with the voluntary associations that employed midwives, to arrange directly with those engaged on private work, or themselves to establish a salaried service. Before submitting the proposals to the Department, however, they were required to consult the local voluntary associations and any organisation that had a right to speak for the midwives. It was inevitable that when the scheme came into full operation the handy woman would disappear. He thought the number of midwives in practice would be reduced by the provisions for compensation on retirement. Moreover, the midwives would be paid either by the local authorities who engaged them or by their own associations and would no longer have the not uncommon experience of rendering services without fee; midwives had thus brighter prospects of a reasonable livelihood than they had had before. If a midwife gave up a certificate within three years after the Bill had been passed she would receive as a compensation three years' average income. If others practised after they had really become unfit they could be called upon to surrender their certificate with the right of appeal to the Department, and they would receive five times their average yearly income for the previous three years.

The local authorities would be free to select their own methods for securing the medical services, so long as these were adequate. In some areas the arrangement would be with all the local medical practitioners willing to undertake the service. In others the antenatal and postnatal examinations might be carried out at the authorities' clinics and arrangements might be made with all the practitioners, or with a limited number, the doctor attending being advised of the results of the examinations. The service under the Bill was not compulsory, but it was expected to be taken advantage of generally.

Fees would be graded according to the patient's means and none would be charged to necessitous mothers. For insured women, the wives of insured men, and women in a similar economic position it was hoped that local authorities would be able to provide a complete range of services at home at a fee not much, if at all, higher than was at present payable for the services of a midwife alone. Women could thus authorise payment to the local authority out of their maternity benefit. Payment of practitioners would be in accordance with scales fixed after consultation with the appropriate doctors' organisations. When the new services were in full operation the additional expenditure, after taking into account the fees recovered, might reach £120,000 per annum. The Bill proposed a grant equivalent approximately to half the total additional expenditure entailed on the local authorities, but scaled in proportion to the need of the area. He hoped that the proposal he made would seem reasonable to the local authorities. He would be prepared to move an amendment providing that the Bill should not come into operation until May 16th, which was the day after the new block grants had begun to run. The local authorities would also receive Exchequer help to the extent of half their liability for compensating midwives who retired during the three years after the Bill took effect. The universities and teaching institutions were concerned about the facilities available for the training of medical students and midwives, but provision was included in the Bill that the local authorities and the Department in exercising their functions would have to maintain the facilities for teaching.

MEMBERS' COMMENTS

Mr. JOHNSTON said that Mr. Elliot had not explained why the maternal mortality-rate in Scotland was 15 per cent. worse than that in England, nor why, in a model area in London, instead of a death-rate of 6 per 1000 as in Scotland, it had been reduced to 0·68. Nevertheless the Labour Opposition welcomed this measure for it was laying the foundations of a new municipal service in midwifery. He was prepared, however, to have not only municipal midwives but also a complete medical service with doctors and midwives in the employment of the local authority. Unless some provision was made for home helps women were not likely to accept readily the offer to go into lying-in hospitals. He asked what provision was to be made for seeing that women were given the nutrition necessary to a mother in childbearing.

Sir ARCHIBALD SINCLAIR asked the Secretary of State for Scotland to explain why this scheme was going to cost so much less than that outlined in the report of the Committee on Scottish Health Services, the total cost of which was to be £310,000. He suggested that if mothers were subjected to pressure from the local authorities in the payment of their maternity benefit they would be reluctant to avail themselves of the provisions of the Bill. It might be wise if only half of the benefit could be transferred to the local authority, if the mother authorised that to be done. The Highlands and Islands attached very great importance to the recommendation of the Committee on Scottish Health Services, that a special supplementary additional grant of £50,000 a year should be made available for the improvement of local authority health services in those areas. Unless some such provision was made, or unless the new formula for the block grant turned out to be fully as generous as Mr. Elliot indicated, he was afraid that this Bill would remain a dead letter in the Highland counties.

Mr. GRAHAM KERR said he had been assured that unless the Bill was amended in one particular respect it would bring about actual deterioration in the domiciliary midwifery of Scotland. For all midwifery cases to be treated in hospital was not yet a matter of practical politics, and there was no convincing evidence that it would be an advantage in the present state of knowledge. The overwhelming majority of cases to-day were attended at home, and it seemed to him, as a biologist, that no more difficult task faced society than the improvement of domiciliary midwifery to the very highest level. To ensure the most efficient training possible in midwifery for the midwife on the one hand and the medical practitioner on the other transcended all else in importance. He had had representations from the Scottish universities and from the great maternity hospitals in Scotland not only that the present Bill failed to ensure this, but that the omission would "in the long run defeat the whole object of the Bill"; that it might in its present form "wreck the outdoor or domiciliary service of the hospital, which is absolutely essential for the training of students and midwives"; and that "the number of properly qualified midwives would inevitably decrease, or, alternatively, the standard of their training would be bound to suffer." He hoped that the Government would add a clause that in every area where there is a recognised medical school the local authority should ensure "that adequate facilities are made available for the practical domiciliary instruction in midwifery of any person undergoing training with a view to becoming a duly qualified medical practitioner or a certified midwife."

Mr. LEONARD suggested that, since many general practitioners did not like to indulge in this work, a panel of practitioners who had given special attention to the subject should be consulted. He also asked that the same restrictions should be placed on all unqualified attendants, whether in maternity homes or in private.—Mr. ALLAN CHAPMAN said that it was

clear that extern training was at least as important as intern training in view of the main object of the Bill. He desired to see mothers protected by requiring a certificated midwife always to be present when a student was handling a case, no exceptions being made.

THE MEDICAL PROFESSION'S VIEW

Sir ERNEST GRAHAM-LITTLE said there was a very considerable danger in regarding this measure as a real contribution to solving a problem that was undoubtedly distressing and disturbing the medical profession more than any other. Any progress to be made would be through the antenatal period, but most of the provisions of this Bill dealt with intranatal measures, which were too late, all the valuable time having been lost. The nutrition of the expectant mother was undoubtedly one of the most important helps to a successful confinement. He instanced the maternal mortality in the Island of Lewis which was less than that in Paddington, the suggested reasons being the very small community there and the excellent fresh diet. Other dangers that only a medical man could discover during the antenatal period were the physical disabilities sometimes requiring Cæsarean section, cardiac pulmonary disease such as tuberculosis, and the most important of all, venereal disease. Sir Ernest supported the plea for more maternity beds, for he said the mortality in well-conducted maternity homes had been very much less than in confinements in the best circumstances at the homes of patients. Valuable experiments could only be made under very skilled observation, and at Queen Charlotte's Hospital, for example, a new drug had been tried for sepsis with the result that the mortality had decreased from 22 per cent. to 2 per cent. Another point was that in the Bill the general medical practitioner was rather left out of the scheme. The colleges and universities, after the General Medical Council had sent out a circular pointing out the enormous importance of students obtaining more practical skill in London and elsewhere, had made some great changes in the medical curriculum to meet this need. If the part played by the general practitioners was curtailed, it would decrease the urge for improving their education. The report of the Committee on Maternal Morbidity and Mortality in Scotland, which he could not commend too highly, indicated certain dangers due to inexperience, of which an important example was a relatively ill-equipped midwife offering to do too much, and nothing was more disastrous at a confinement. Antenatal care lessened the need to interfere, for it forestalled danger. He would rather spend far more money upon these preparatory measures than on the actual operation of delivery itself, which should be, but very often was not, a really normal physical process. It was from the point of view of giving a false idea of security that he thought this Bill would be somewhat of a disappointment to the medical profession.

THE GOVERNMENT'S REPLY

After further debate, Mr. T. M. COOPER, Lord Advocate, replying for the Government, said that the Bill was not concerned with institutional treatment, because that was covered by other measures. The authorities were blind neither to the necessity of pursuing the attack on the problem by means of institutional treatment, nor to the advantages to be secured from better nutrition for pregnant and nursing women. The present Bill's limited purpose was to provide adequate domiciliary midwifery service. Accounting for the discrepancy between the estimated expenditure of £120,000 per annum and the £310,000 in the report of the Committee on Scottish Health Services, he said the latter figure included a considerable sum for expenditure that was not included under this Bill, while the £120,000 did not take into account the payments which would be made for the services rendered. If it was thought that the Bill could not secure adequate facilities for teaching midwifery the Secretary of State for Scotland and himself would be happy to examine any other formula which would achieve that object. The continued supply of competent midwives and doctors was an integral part of the scheme, and they must so adapt their legislation and administration as to enable this to be done. On the proposal to exempt from penalty various categories of persons, he said there was all the difference in the world between unqualified interference in a private house, where a great deal of mischief could be done, and unqualified assistance in an institution under the supervision of qualified medical practitioners. The first of the four heads, he concluded, for which provision had to be made in the schemes of local authorities was medical examination and treatment during pregnancy as distinct from childbirth. This was certainly intended to include what was dealt with in the report on maternal morbidity under the heading of prenatal treatment. Therefore the whole weight of the endeavours of the central Department and the local authorities would be bent upon dealing with what, according to the reports that they had to guide them, was probably the most crucial period in the cure of maternal morbidity and the reduction of maternal mortality.

The Bill was read a second time, and the financial resolution in connexion with it was afterwards agreed to in Committee.

In the House of Lords on Feb. 2nd the Ministry of Health Provisional Order (Evesham and Pershore Joint Hospital District) Bill was read a first time.

QUESTION TIME

WEDNESDAY, JAN. 27TH

Experiments on Animals

Mr. SANDYS asked the Home Secretary whether he could give figures to show the average annual number of surgical experiments performed upon animals by vivisectors without the use of an anæsthetic; and what steps were taken by his department to ensure that the potential gain to scientific knowledge was commensurate with the suffering caused.—Mr. GEOFFREY LLOYD, Under-Secretary, Home Office, replied: I presume my hon. friend refers to severe surgical experiments which usually involve cutting operations. The Cruelty to Animals Act, 1876, provides that experiments may be performed without anæsthetics on a certificate, called Certificate A, being given that insensibility cannot be produced without necessarily frustrating the object of such experiments. Before my right hon. friend allows any such certificate to come into operation he always attaches to the Licence a condition whereby no operative procedure more severe than simple inoculation or superficial venesection may be adopted in any of the experiments enumerated in the certificate. The kind of experiments to which I presume my hon. friend refers are therefore never allowed without anæsthetics and consequently the second part of the question does not arise.

Death-rate among Pensioners

Mr. RHYS DAVIES asked the Minister of Pensions if he would state the death-rate among adult male pensioners for each of the groups, 30 to 40 years of age, 40 to 45, and 45 to 50.—Mr. RAMSBOTHAM replied: The death-rates per thousand of adult male disability pensioners (Other Ranks) calculated for each of the age-groups specified, for the year ended 31st March, 1936, were as follows. For comparative purposes the death-rates for the corresponding groups of the civil (male) population have been added.

Age-group.	Death-rate.	Civilian.
35–39 years	7·1	4·8
40–44 ,, ...	8·7	6·4
45–49 ,, ...	14·4	9·3

As there are only 250 pensioners under 35 years of age, the age-group 35–39 has been adopted.

THURSDAY, JAN. 28TH

State Management of the Drink Traffic

Mr. LOVAT-FRASER asked the Home Secretary if, in view of the statement by the Select Committee on Estimates that the cost of the London office for the State management of the drink traffic in Carlisle, Gretna, and Cromarty appeared to be excessive, he had taken or proposes to take any action; and if, in view of the recommendation of the Select Committee on Estimates that the whole organisation of the scheme for the State management of the drink traffic in Carlisle, Gretna, and Cromarty should be reconsidered, he proposed to take any action.—Sir JOHN SIMON replied: The recommendations of the Select Committee have been considered by my right hon. friend, the Secretary of State for Scotland, and myself. Making allowance for the fact that the cost of the London Office referred to by the committee includes the cost of the architect and his staff, the room for any saving in this item appears to be small, but I am considering whether any reduction will be practicable. After reviewing the general organisation of the undertakings in England and Scotland, my right hon. friend and I do not propose to alter the existing system. This does not, of course, preclude consideration from time to time of possible improvements in the organisation.

Health Insurance Ophthalmic Regulations

Mr. EDWARD WILLIAMS asked the Minister of Health whether he had considered the representations from the Institute of Chemist-Opticians and other pharmacists as regards national health insurance, ophthalmic, and optical benefits, in draft Statutory Rules and Orders, 1936, No. 434; and what action he proposed to take in view of these representations.—Sir KINGSLEY WOOD replied: The representations which have been made on behalf of the Institute of Chemist-Opticians will be brought to the notice of the Approved Committee to be set up under the new regulations. This committee is to include representatives of approved societies and organisations of opticians, amongst which I understand that the Institute of Chemist-Opticians is to be included, and it will be the duty of the committee to determine the qualifications which will entitle opticians to inclusion in a list of those to be recognised for the purposes of ophthalmic benefit.

British Pharmacists and Anti-Gas Work

Mr. MITCHELL asked the Home Secretary what precise arrangements were to be made for training British pharmacists in anti-gas work; and whether any retaining fees would be paid to pharmacists for their assistance in the anti-gas scheme.—Mr. GEOFFREY LLOYD replied: The Pharmaceutical Society generously offered the coöperation of its members in connexion with air-raid precautions, and this offer was gratefully accepted. After discussion it was agreed that in the event of an emergency pharmacists could probably give the greatest service by carrying on with their ordinary work. Arrangements will be made as soon as possible for a number of places at the Civilian Anti-Gas School to be reserved for members of the society, who will be trained as instructors with a view to their training other members of the Society in anti-gas precautions. The answer to the second part of the question is in the negative.

Scarlet Fever in Doncaster

Mr. SHORT asked the Minister of Health the additional cost to the ratepayers of Doncaster and the rural area, respectively, due to the recent scarlet fever epidemic.—Sir KINGSLERY WOOD replied: I am informed that the additional cost to the rates, due to the recent outbreak of scarlet fever caused by infected milk, is at present estimated at £365 in the borough of Doncaster, and £70 in the rural district.

Hollywood Mental Hospital Medical Staff

Sir ARNOLD WILSON asked the Minister of Health whether any inquiry had been or would be held by his department as to the circumstances in which a medical practitioner at Hollywood Mental Hospital was retained on the staff although to the knowledge of the chief resident medical officer, as stated at the inquest on the body of the man in question, he had been drinking heavily for the past eight years; and whether he was satisfied that the charge of mentally afflicted persons could safely be entrusted to men so affected.—Sir KINGSLEY WOOD replied: I am aware of the press report of statements made at the inquest referred to, and I am in communication with the committee of the hospital. I should like to say, however, that the hospital in question has maintained a high standard in the care and treatment of the patients.

Deaths at Papworth Sanatorium

Mr. ROWSON asked the Minister of Health the total number of deaths from tuberculosis and other causes which had occurred at Papworth Sanatorium, Cambridgeshire, and also in Papworth Village Settlement, during the past seven years.—Sir KINGSLEY WOOD replied: I am informed by the authorities of the Cambridgeshire Tuberculosis Colony, Papworth, that the total number of deaths which have occurred in the colony's hospital during the last seven years is 359, of which 28 were deaths of persons transferred from the Village Settlement, and that the number of deaths actually occurring in the Village Settlement during the same period was 13. I cannot at present state the precise proportion of these deaths which were due to tuberculosis, but I am making inquiries and will inform the hon. Member of the result. I should add that the colony receives patients in all stages of tuberculosis, including advanced cases.

Captain HEILGERS: Is it not a pity that anything should be said which might damage the reputation of an institution which has done most effective work for sufferers from tuberculosis?

Sir KINGSLEY WOOD: I did not understand that that was the case. This is, however, a fine example of the excellent work which is being done in the matter.

Papworth Sanatorium: Employment of Patients

Mr. ROWSON asked the Minister of Health if he was aware that persons suffering seriously from tuberculosis were employed in factories at Papworth, and in some cases so employed until a few days before death; and if he would have an inquiry made into this situation.—Sir KINGSLEY WOOD replied: I am making inquiries into this matter and will inform the hon. Member of the result.

The Budget and Family Allowances

Mr. RANKIN asked the Chancellor of the Exchequer whether his attention had been called to the rapid decline in population which was expected to take place in this country during the next 25 years; and whether, in view of the difficulties which such a reduction would cause from the point of view of revenue, he would give special consideration, in connexion with his forthcoming budget, to a further increase in family allowances.—Mr. CHAMBERLAIN replied: My hon. friend may rest assured that all relevant factors will be taken into consideration in framing the budget.

Maternal Mortality in Edinburgh and Glasgow

Mr. GUY asked the Secretary of State for Scotland the figures for maternal mortality per thousand births in Edinburgh and Glasgow respectively for the last three years.—Mr. ELLIOT replied: The rates of maternal mortality per 1000 births for 1934, 1935, and 1936 were in the case of Edinburgh 5·3, 5·3, and 5·5 and in the case of Glasgow 6·0, 7·0, and 5·9. The 1936 rates are provisional.

Alcohol and Road Accidents

Mr. HARDIE asked the Minister of Transport if he was aware that a motorist, convicted at the Old Bailey on Jan. 19th for dangerous driving, was charged by the judge as one of those who killed people on the roads because they drink more than they ought; and whether, as this and similar cases were not entered in the annual statistics as accidents due to drink, he would have the method of collection revised so that the statistics might

be a fairer reflection of the facts concerning alcohol and road accidents.—Mr. HORE-BELISHA replied: Road accidents attributable to drink or drugs are already so classified. In the case in question a sentence of six months in the Second Division accompanied by a suspension of licence for seven years was recorded on a conviction for dangerous driving. The judge observed that the person convicted was "in a sort of twilight of sobriety" but there is no special subhead for this condition.

Basement Dwellings in London

Mr. LYONS asked the Minister of Health if any recent investigations had been made into the number and nature of basement dwellings in various parts of London and with what results.—Sir KINGLSEY WOOD replied: The most recent investigation was made in 1934. According to the returns then obtained by the London County Council from the metropolitan borough councils, 20,108 underground rooms in use for sleeping purposes were deemed to be unfit for human habitation within the meaning of section 18 of the Housing Act, 1925.

MONDAY, FEB. 1ST

Government Employees in Basement Offices

Lieut.-Commander FLETCHER asked the Parliamentary Secretary to the Ministry of Health, as representing the First Commissioner of Works, if he had received any representations concerning Government employees compelled to work in basement offices; and, if so, what departments were concerned and what action was proposed.—Mr. R. S. HUDSON replied: Representations have been received by my noble friend from the Staff Sides of the Departmental Whitley Councils for the Board of Education, Ministry of Health, Board of Trade and Office of Works concerning the continued use by clerical staffs of the basement courts of the Government Offices, Westminster, Southern Block. Pending the vacation of the basement courts, in accordance with the arrangements as originally planned, consideration is being given to the points raised by the staffs as to the detailed working of the ventilation arrangements and the improvement of the access to the basement.

Physical Training in Schools

Mr. SHORT asked the President of the Board of Education how many local educational authorities had appointed special organisers for physical training; and whether Doncaster was among the number.—Mr. G. SHAKESPEARE, Parliamentary Secretary to the Board of Education, replied: 170 local education authorities have appointed one or more whole-time or part-time organisers of physical training and a number of other authorities are considering the question of making such appointments. The number of organisers now employed by local education authorities is 236. A proposal for the appointment of organisers has not yet been received from the Doncaster authority, but it is understood that the authority are considering the matter, and the Board wrote to them on Dec. 1st last calling their attention to its importance.

Children's Branch of Home Office

Mr. LOVAT-FRASER asked the Home Secretary why his office had ceased to issue reports of the children's branch.—Mr. GEOFFREY LLOYD, Under Secretary, Home Office, replied: There are a number of reasons—in particular the additional labour involved in the preparation and bringing into force of the Children and Young Persons Act, 1933—which have prevented the issue of a report in recent years. My right hon. friend is fully aware of the value of these reports and a further report will be issued as soon as circumstances permit.

Experiments among Recruits Below Standard

Mr. BELLENGER asked the Secretary of State for War whether he could make a statement on the experiment of special training and nourishment for certain selected recruits under standard; and whether he proposed to extend the experiment to include large numbers of recruits now rejected as unfit.—Mr. DUFF COOPER replied: At the end of the initial three months' training, 31 of the 33 recruits who had been selected for experiment were adjudged to be fit to start the normal recruits, course and were passed to their regimental depôts for this purpose. Twenty-four have since been passed as up to standard, while 7, who have not yet reached normal standard, but have made such progress as to justify their retention, are under special observation at their depôts. The experiment is regarded as successful, and its practical application on a larger scale is under consideration.

Government's Physical Training Scheme

Mr. SANDYS asked the President of the Board of Education whether he could announce the Government's plans for improving the national standard of physical fitness.—Mr. OLIVER STANLEY replied: I hope that a White Paper explaining the Government's proposals will be issued on Thursday next.

B.M.A. and Medicine Advertisements in Stamp Books

Sir NICHOLAS GRATTAN-DOYLE asked the Postmaster-General whether he had received representations from the British Medical Association respecting certain classes of advertisements appearing in the books of stamps issued by the Post Office; and whether he proposed to take action in the matter.—Sir W. J. WOMERSLEY, Assistant Postmaster-General, replied: Representations on this subject were received from the British Medical Association a few years ago. My right hon. friend recently reviewed the matter in connexion with a question asked on Dec. 7th last, and found no reason for altering the present policy, which is to exclude advertisements of medicines purporting to cure certain diseases specified in Paragraph 58 of the Report of the Select Committee on Patent Medicines, 1914, but to accept other advertisements whose wording is not objectionable and whose bona fides is not suspect.

A CLEARING-HOUSE FOR HOSPITAL EMERGENCIES IN LONDON

THE Voluntary Hospitals Committee for the county of London, which since its constitution in July, 1935, has done so much to make the voluntary principle effective, has now embarked on a new and ambitious scheme. It is nothing less than the provision of a central office to facilitate the admission to voluntary hospitals of emergency and acute cases. There are already arrangements for the transference of accident cases from voluntary to municipal hospitals, and these are now being extended by arrangement with county councils outside London; but apart from accidents it still happens that a doctor who is in urgent need of a bed for an acutely ill patient has to ring up a number of hospitals before he can find one. A central office would be able to tell him forthwith where to send his patient, and would warn the hospital of the patient's impending arrival. It is difficult to see whether doctor, hospital, or patient would gain the more by such a clearing-house. All the hospitals have been consulted and nearly 100 have replied; 61 of them have expressed willingness to coöperate in the proposal, and only 3 stand out. This unusual degree of unanimity should ensure the success of the scheme if it is in the hands of promoters who admit no discouragement. The working out of the proposal has been remitted to a committee consisting of Dr. A. M. H. Gray, Dr. Geoffrey Evans, with the chairman and hon. sec. (Prof. L. S. Dudgeon) of the committee, and Mr. A. J. Gardham, F.R.C.S., and Mr. C. M. Power as coöpted members.

PUBLIC HEALTH

Accredited Milk

ON Jan. 28th a conference was held at the Central Hall, Westminster, under the auspices of the Royal Sanitary Institute, and attended by delegates from all over the country, to consider the administration of the Milk (Special Designations) Order, 1936, with respect to accredited milk. Mr. THOMAS BAXTER, chairman of the Milk Marketing Board, presided and explained the aims of the Board in establishing a roll of accredited producers.

The discussion was opened by Dr. W. G. SAVAGE, medical officer of health for Somerset, who pointed out that, while on paper there was reasonable uniformity, in practical working there were material divergencies. Three requirements he regarded as essential: (1) compliance with the Milk and Dairies Order, 1926, (2) provision and utilisation of efficient means of steam sterilisation, (3) provision of certain minor equipment essential for clean milk production. The main divergence arose over the first requirement owing to the vagueness in the wording of the order and the different interpretations placed on its enforcement. Uniformity of administration suffered from the varied types of officer employed to carry out the inspections, but this did not matter much, for the only basis on which uniformity of practice could be attained was uniformity of knowledge. The inspecting officer should be one who had acquired special experience in clean milk production. Clean milk production could not be controlled by printed requirements; suitable premises were necessary, but they were not so important as trustworthy methods.

Mr. F. W. MEDLOCK, chief veterinary officer to the Essex C.C., dealt with the veterinary aspects of the problem and discussed the difficulties of laboratory sampling.

Mr. F. H. LONG, chief sanitary inspector to the Hereford R.D.C., insisted that the local sanitary authorities and their inspectors were responsible for the operation of most of the order and that their coöperation was essential. He admitted the wide differences of administrative practice.

Mr. W. T. PRICE, agricultural organiser to the Wilts C.C., dwelt on the agricultural side and the need to associate the organisers with the work.

VETERINARY CONTROL

When the meeting was thrown open to discussion many persons prominent in milk control took part; each speaker emphasising the importance of the particular office or section which he represented. There was however a general feeling that it should be possible for the various interests to get together and evolve a scheme for more uniform administration.

Several veterinary officers present regarded Dr. Savage's remark on the value to the accredited milk scheme of veterinary inspection as a criticism of the value of veterinary work generally. Dr. Savage replied that he was strongly in favour of enlisting veterinary surgeons in any scheme for improving the milk-supply—he was in fact himself largely responsible for whole-time veterinary surgeons having been appointed in his own county—but he felt they were misapplied in routine veterinary inspection and should be utilised mainly to build up herds free from tuberculosis. The words to which exception were taken were "Personally I do not regard the veterinary control required as materially influencing its safety"—and this was, Dr. Savage suggested, a scientific matter capable of being judged by the application of scientific facts. He agreed that the quarterly veterinary inspection required under the Accredited Scheme was of service to the milk producer, but it did not materially influence the safety of the milk. Most of the conditions detected, of which mastitis was the commonest, were of importance in relation to the health of the herd, but of no moment as regards human safety, for they were not transmissible to man. The veterinary control did not concern itself with undulant fever and practically the only disease which came into question was tuberculosis. But this control had no effect on the incidence of bovine tuberculosis and indeed no such effect was to be anticipated. Some slight reduction might be expected in the incidence of tubercle bacilli in the milk, but examinations of Grade A or accredited milk all over the country showed still a high proportion of samples containing tubercle bacilli. For 1936 in Somerset, of all the 442 samples collected at farms 3·3 per cent. were positive; in the samples from accredited farms taken separately the percentage was not smaller. Veterinary control did not, alas! materially influence the safety of accredited milk.

Ophthalmia Neonatorum

It is the statutory duty of the maternity and child welfare authority to give assistance in cases of ophthalmia neonatorum by providing nursing in the home and, if deemed advisable, hospital treatment outside it. The time element is important as the value of treatment depends chiefly on the speed with which it is given. But this authority does not now receive as by right the information it needs to do this; it comes only indirectly through the county authority. The Ministry of Health has been urged to arrange that ophthalmia should be notified directly to the M.O.H. of the M. and C.W. authority, and this will be ensured as from April 1st next by new regulations (1937, No. 35). The M.O.H. of a district council which is not a M. and C.W. authority will now receive from the county M.O.H. prompt information of any cases occurring in his district, and contrariwise the county M.O.H. will learn of all cases which occur in the administrative county. The new arrangement, although it sounds complicated, will simplify procedure and will ensure that the baby whose eyes are in danger gets the right kind of attention in the shortest time.

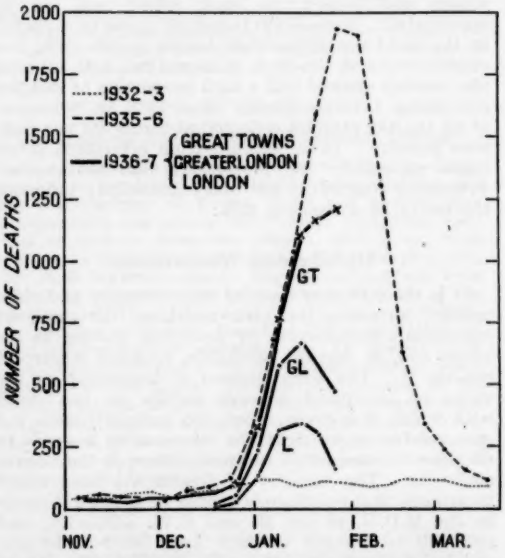
The Welsh Tuberculosis Scheme

A frank discussion took place last week between the King Edward VII Welsh Memorial Association and the contributing authorities. Lord Davies, who presided, admitted that the hopes of rapid progress with which the Association started twenty years ago had not been realised. The mortality-rate of tuberculosis per 100,000 of the Welsh population had only dropped in the period from 110 to 92, compared with a drop in England from 103 to 70, and in Scotland from 111 to 74. The Association is proposing to build a new tuberculosis hospital of 250 beds at Swansea, and to form a nucleus of two village settlements, the total expenditure for the five-year period being estimated at nearly £500,000. The contributing authorities complained that the halfpenny rate of 1912 had increased to a fivepenny rate in counties like Flint, and they were spending on tuber-

culosis more than half the whole outlay on public health services. The scheme is to be further considered by financial experts.

Influenza

Last week influenza accounted for 1155 deaths in England and Wales, and for 154 deaths in London. Reference to the graph will show better than words the trend of the epidemic up to Saturday last. In the previous week although London had passed the peak the midland and northern areas were still showing higher returns—e.g., Birmingham 51, Nottingham 26, Sheffield 49, and Manchester 41 deaths While in London we are breathing freely—the



Graph showing total deaths from influenza in the Great Towns on the last day of each week in three different years.

notifications of pneumonia last week dropped from 326 to 211—the situation in the north is less satisfactory. In Liverpool for example many cases are being admitted to hospital with capillary bronchitis, and extreme prostration is a feature even of uncomplicated cases. In Sheffield there were 65 deaths last week. Throughout Scotland the epidemic is still causing inconvenience. Practitioners on the whole, however, are less busy than they were two weeks ago, and in Edinburgh there is an impression that the worst is over. Although last week's death-roll was the highest since the 1929 epidemic, 78 per cent. of those who died were over the age of 45. In Dublin influenza has become more widespread and many business establishments are suffering from depletion of staffs. In several hospitals inconvenience has arisen from the large number of nurses ill, and some visiting staffs are suffering heavily. The type of disease has not generally been grave.

Small-pox in Failsworth

The two cases of small-pox notified in a recent return from Failsworth illustrate the difficulties of dealing with the disease when it occurs in so mild a form. On Jan. 11th Mrs. A, aged 62, was removed to Hartshead small-pox hospital. She had taken ill on Jan. 3rd with headache and pains in the back, and the rash appeared on Jan. 6th. She had been vaccinated in infancy but not since. Her illness ran a mild course, and she was discharged on Jan. 29th. The urban district of Failsworth is contiguous to Oldham where a small outbreak occurred in December, but it was only after intensive oblique inquiry that it was discovered that Mrs. A's sister, Miss B, aged 72, living in the same house, had been indisposed from Dec. 21st to 23rd, and when examined on Jan. 12th was found to have a fading rash on face and forearms. The diagnosis was confirmed the following day, and Miss B was removed to the small-pox hospital from which she was discharged well on Jan. 22nd. She had been vaccinated in infancy and again on Jan. 11th after removal of her sister. On further inquiry it turned out that Miss B had visited at the two houses in Oldham where the four previous cases had occurred. The patients were in fact her near relations, and the Failsworth cases were thus brought into their natural relation with the Oldham outbreak. All the contacts in the Failsworth house have been revaccinated, as well as the staff of the public health department and the doctors in attendance.

INFECTIOUS DISEASE

IN ENGLAND AND WALES DURING THE WEEK ENDED JAN. 23RD, 1937

Notifications.—The following cases of infectious disease were notified during the week: Small-pox, 0; scarlet fever, 1671; diphtheria, 1294; enteric fever, 61; pneumonia (primary or influenzal), 3135; puerperal fever, 42; puerperal pyrexia, 147; cerebro-spinal fever, 34; acute poliomyelitis, 3; encephalitis lethargica, 10; dysentery, 21; ophthalmia neonatorum, 72. No case of cholera, plague, or typhus fever was notified during the week.

The number of cases in the Infectious Hospitals of the London County Council on Jan. 29th was 3701, which included: Scarlet fever, 833; diphtheria, 1014; measles, 17; whooping-cough, 582; puerperal fever, 19 mothers (plus 8 babies); encephalitis lethargica, 286; poliomyelitis, 2. At St. Margaret's Hospital there were 20 babies (plus 8 mothers) with ophthalmia neonatorum.

Deaths.—In 122 great towns, including London, there was no death from small-pox, 4 (0) from enteric fever, 6 (0) from measles, 5 (1) from scarlet fever, 28 (7) from whooping-cough, 34 (7) from diphtheria, 33 (10) from diarrhœa and enteritis under two years, and 1137 (273) from influenza. The figures in parentheses are those for London itself.

Liverpool reported all the 4 deaths from enteric fever, Middlesbrough had 3 deaths from whooping-cough, Stockton-on-Tees and Grimsby each 2. Fatal cases of diphtheria were reported from 17 great towns; Hull and Liverpool each 4, Manchester and Sheffield each 3.

The number of stillbirths notified during the week was 308 (corresponding to a rate of 48 per 1000 total births), including 37 in London.

LEICESTER CITY HOSPITAL.—Leicester health committee on Jan. 22nd passed plans for extensions at this hospital which will include accommodation for the aged, and chronic sick, and a new nurses' home. The estimated cost of the scheme is given as £300,000.

WESTMINSTER HOSPITAL.—As a result of the festival dinner held at the Mansion House in aid of this hospital £12,900 has been collected towards the Coronation wing of the new building and £1000 as an endowment of which the income is to be used to provide additional comforts for nurses and extra holidays for convalescent nurses.

MEDICAL NEWS

University of Oxford

Mr. Hugh Cairns has been appointed to the Nuffield chair of surgery and Dr. R. R. Macintosh to the Nuffield chair of anæsthetics.

Mr. Cairns, who is 40 years of age, was educated at the Adelaide High School and is a medical graduate of Adelaide University where he was exhibitioner, Davies-Thomas scholar, and Everard scholar. After serving with the Australian Army Medical Corps he entered Balliol College as a Rhodes scholar in 1919. He worked in the department of physiology, and rowed in the Oxford boat in 1920. He was house surgeon at the Radcliffe Infirmary in 1921 and in the same year went to the London Hospital, serving successively as house surgeon, house physician, pathological assistant, and first assistant in the surgical unit. He took the fellowship of the Royal College of Surgeons of England in 1921. In 1926 he was elected to the staff of the London Hospital and was then given leave of absence to go with a Rockefeller fellowship to the United States, where he became for a year assistant resident surgeon in Dr. Harvey Cushing's clinic in Boston. On his return he wrote a "Study of Intracranial Surgery," which the Medical Research Council published in its special report series (No. 125). Since then, after some years on the general surgical staff, he has established at the London Hospital a department of neurosurgery largely inspired by Cushing's ideals. A recent paper which illustrated his continued association with the Boston clinic and the methods employed both there and in London is his account of the fate of patients operated on for intracranial tumour during his visit to the United States in 1926 (THE LANCET, 1936, **1**, 1223, 1291). Mr. Cairns has also written much on brain abscess and head injuries and their treatment, and in 1926, before devoting himself to intracranial surgery, he gave a Hunterian lecture to the Royal College of Surgeons of England on neoplasms of the testicle. In 1935 he was awarded the triennial gold medal of the West London Medico-Chirurgical Society. He is also honorary surgeon to the National Hospital, Queen-square.

Dr. Macintosh, who is 39, is a former student of Guy's Hospital. He qualified in 1924 and two years later obtained the fellowship of the Royal College of Surgeons of Edinburgh. His post-graduate experience included appointments in the venereal diseases department of Guy's, at Lambeth Hospital, and at the British Hospital at Montevideo (Uruguay), where he was resident surgical officer. On returning to England he began to practise as an anæsthetist, with an honorary appointment in the dental school at Guy's. He is now anæsthetist to the Throat Hospital, Golden-square, and anæsthetist and lecturer in anæsthetics in the dental department of University College Hospital. He has written on blood transfusion and on anæsthetics in dental surgery, and a few years ago contributed to the "Battle of the Barbiturates" in our correspondence columns, where he wrote of the importance of developing methods of pre-anæsthetic medication.

Prof. Cairns's appointment dates from Jan. 27th and Prof. Macintosh's from Feb. 17th. It is understood, however, that their duties will at present allow them to go on with their work in London.

Royal College of Physicians of London

A comitia of the College was held on Jan. 28th with Viscount Dawson of Penn, the president, in the chair. The election of the president as a vice-president of the Imperial Cancer Research Fund was approved and Dr. E. Mapother was elected a councillor. The following were appointed delegates of the College: Lord Dawson of Penn to the centenary celebrations of the University of Durham, July 1st to 3rd; Dr. H. P. Newsholme to the health congress of the Royal Sanitary Institute at Birmingham, July 12th to 17th; Lord Horder to the annual congress of the Royal Institute of Public Health at Margate, May 25th to 29th; and Dr. H. C. Cameron to the seventh English-Speaking Conference on Maternity and Child Welfare to be held in London, June 1st to 3rd.

Dr. D'Arcy Hart will deliver the Milroy lectures on measures for the prevention of pulmonary tuberculosis among adults in England—in the past and in the future on Feb. 18th and 23rd; Dr. D. E. Denny-Brown the Goulstonian lectures on the nervous control of micturition and its disorders on Feb. 25th, March 2nd and 4th; Dr. Crighton Bramwell the Lumleian lectures on the arterial pulse in health and disease on March 9th and 11th; and Dr. H. Gardiner-Hill the Oliver-Sharpey lectures on growth and development, their pathological aspects on March 16th and 18th. All the lectures will be given at the College at 5 P.M. The following candidates having satisfied the censors' board were admitted members of the College:—

Frank Longstaff Apperly, M.D. Oxon., M.D. Melb.; Bidya Pati Bhattacharjya, M.B. Patna; Bernard Roy Bramwell, M.D. Manch.; Francis Staples Brien, M.B. Toronto; John Alfred Brocklebank, M.B. Lond.; George Horace Brookman, L.R.C.P. Lond.; James William Douglas Bull, M.B. Camb.; Renfrey Gershon Burnard, M.B. Adelaide; Archibald Malcolm Gordon Campbell, M.B. Oxon.; Winston Stephen Charters, M.B. N.Z.; Stephen Thomas Falla, M.D. Lond.; John Ronald Forbes, M.B. Lond.; Graham William Hayward, M.B. Lond.; Dorothy Jane Healey, M.D. Lond.; Tom Shadick Higgings, M.D. Lond.; Norman George Hulbert, M.B. Camb.; Norman Maurice Jacoby, M.B. Lond.; Alan Robert Kelsall, B.Chir. Camb.; Peter James Kerley, M.D. Dubl.; Frederick Basil Kiernander, M.B. Lond.; Mary Fauriel Lockett, M.D. Lond.; William Neville Mann, M.B. Lond.; Harry Blight May, M.B. Camb.; Edward Laurence Oliver Murphy, M.B.N.U.I.; Richard Alan Pallister, M.D. Durh.; James Alan Price, M.D. Belf.; Alan Boynton Raper, M.D. Leeds; John Clifford Richardson, M.D. Toronto; Leon Eric Rothstadt, M.D. Melb.; Charu Chandra Saha Saha, M.B. Calcutta; Dominic Victor Sheil, M.B. Melb.; Henry James Sinn, M.B. Melb.; Alan Herbert Thompson, M.D. Dub.; Aly Fahmy Zanaty, M.B. Cairo.

Licences to practise were conferred on 178 candidates (156 men and 22 women) who have passed the final examination of the Conjoint Board. The following are the names and medical schools of the successful candidates:—

K. D. G. Abbott, Manch.; E. M. Abelson, Leeds and West Lond.; J. C. Adams, St. Mary's; A. S. Aldis, Univ. Coll.; C. F. S. Alken, Oxon and Middlesex; J. H. Armstrong, St. Bart.'s; Mary Barker, Sheff.; H. M. Barnett, Witwatersrand and Lond.; I. H. Baum, St. Bart.'s; A. M. Beemer, St. Mary's; Bryant Bell, Witwatersrand and Guy's; A. J. Bernfield, Middlesex; Lily Black, Leeds; L. H. Blakelock and G. W. Boden, St. Bart.'s; Eric Bolton, Cambridge and Univ. Coll.; E. R. Bowes, Guy's; Audrey F. M. Briggs, Camb. and Roy. Free; E. K. Brownrigg, Middlesex; J. B. Bunting, Camb. and St. Thomas's; G. L. Burgess, Guy's; Margaret M. Burton, Roy. Free; M. A. Carpenter, St. Bart.'s; R. W. Clarke, St. Thomas's; C. L. Clinton-Thomas, Univ. Coll.; P. R. K. Coe, Westminster; S. M. Cornes, Manch.; H. D. Crosswell, Middlesex; John Dalziel, and G. H. Darke St. Bart.'s; P. M. Davies, Guy's; H. N. Davy, Camb. and St. Thomas's; P. C. Dhanda, Punjab and West Lond.; W. R. S. Doll, St. Thomas's; I. A. Donaldson, Middlesex; R. C. Droop, Camb. and St. Thomas's; G. H. H. Dunkerton, King's Coll.; J. A. Dunlop, St. Thomas's; R. W. Dunn, St. Bart.'s; H. J. Eastes, Univ. Coll.; C. H. Edwards, Guy's; B. H. Ellis, St. Bart.'s; J. S. Ellis, Camb. and St. Thomas's; J. E. Ennis, St. Bart.'s; L. C. de R. Epps, Camb. and St. Thomas's; M. M. Ernst, Univ. Coll.; Mildred G. Ernst, Roy. Free and West Lond.; R. G. G. Evans, Cardiff; G. R. Faber, Camb. and Lond.; Mary N. Fawcett, King's Coll.; J. G. Fife, St. Mary's; F. D. M. Flowerdew, St. Thomas's; Lancelot Foster and R. A. Foucar, St. Bart.'s; Gwenda M. Francis, Roy. Free; D. G. Freshwater, Camb. and Westminster; A. R. Garner, Lond.; M. N. Genena, Univ. Coll.; Sidney Gnessen, Lond.; Douglas Graham-Brown and P. H. K. Gray, Guy's; W. M. Gray, King's Coll.; B. J. Green, Liverp.; T. A. Hale-Monro, Guy's; E. H. Hambly, St. Bart.'s; R. P. Harbord, Liverp.; William Hargrave-Wilson, St. George's; D. H. Harrison, St. Thomas's; M. W. Harvey and George Herbert, St. Bart.'s; Irene K. Hezlet, Univ. Coll.; C. A. St. C. Hiley, Lond.; Constance M. Hill, Birm.; Emily C. Hill, West Lond.; William Hobson, Leeds; Margaret J. Honeywill, Univ. Coll.; C. W. Horncastle, King's Coll.; Jacob Horowitz, Univ. Coll.; A. M. Howard, Cardiff; H. N. G. Hudson, Middlesex; Gertrude L. E. Hughes, Roy. Free; D. A. Ireland, Oxf. and St. Thomas's; Isaac Isaacs, Cardiff; G. C. A. Jackson, St. Thomas's; Harry Jackson, St. Bart.'s; E. M. Japha, Middlesex; O. L. Jones, Liverp.; Arthur Jordan, St. Bart.'s; H. S. Kander, St. Mary's; Mary Kane, King's Coll. and Cardiff; Sidney Kaye, Lond.; J. G. Kee, St. Mary's; Colman Kenton and Joseph Ketcher, Lond.; C. C. Kirby, St. Mary's; L. M. Klusky, Lond.; F. D. W. Knight, St. Bart.'s; G. S. A. Knowles, Lond.; D. W. Lacey, Middlesex; Iris M. Lamey, Roy. Free; R. L. Lamming, Leeds; J. D. Laycock, St. Thomas's John Leiper, Liverp.; J. W. M. Leslie, St. Thomas's; B. G. A Lilwall, Guy's; C. J. Longland, St. Bart.'s; Myer Lubran, A. D. McDonald and H. A. McDonald, Guy's; W. H. McDonald, Lond.; N. R. McEvoy, Guy's; Robert McGladdery, St. Bart.'s; H. McD. Mackey, Leeds; Norma M. MacLeod, King's Coll.; K. J. Mann, Univ. Coll.; G. S. Midgley, Westminster; A. E. Miller, Middlesex; Eleanor M. Mills, Manch.; A. D. Milne, Guy's; J. G. Mitchell, Camb. and St. Bart.'s; R. H. B. Mole, and K. W. Monks, Camb. and St. Thomas's; E. R. Mountjoy St. Bart.'s; M. A. H. Munshi, Univ. Coll.; W. M. Owen, St. Thomas's; A. C. D. Parsons, Westminster; H. A. Pearce, St. Bart.'s; G. L. Pett, St. Thomas's; Charles Porter, Oxon and St. Thomas's; K. J. Powell, Univ. Coll.; T. C. Probyn, Camb. and King's Coll.; Solly Pruss, Lond.; D. P. Puri, Punjab and West Lond.; A. N. Redfern, Guy's; J. E. Rees, King's Coll.; H. S. Resnik, Witwatersrand and St. Bart.'s; Nancy E. G. Richardson, Univ. Coll.; R. B. K. Rickford, St. Thomas's; A. C. Ricks, Guy's; Elizabeth J. Rooke, Univ. Coll.; H. L. M. Roualle, St. Bart.'s; P. B. L. Saltman, Witwatersrand and St. Bart.'s; A. A. Shein, Guy's; Alexander Simpkin, Liverp.; Gurbachan Singh-Janda, Jefferson and West Lond.; John Smallpeice, King's Coll.; C. P. Smith, Middlesex; E. R. Smith, St. Thomas's; J. A. Smith, Birm.; Katharine D. Smith, Roy. Free and Leeds; G. R. Steed, King's Coll.; W. A. Steel, Univ. Coll.; R. Y. Stevenson, St. Bart.'s; Ethel M. Strong, Roy. Free; R. B. Taylor, Lond.; R. Y. Taylor, Oxon and Guy's; W. H. A. Thorne, St. Thomas's; H. L. Thornton, St. Mary's; G. C. Tresidder, Lond.; F. D. Truax, Guy's

Neville Tsan, Camb. and St. George's; A. G. Turner and D. P. van Meurs, St. Thomas's; Daisy C. Wallace, A. J. N. Warrack, St. Thomas's; G. R. Waterman, Lond.; Joan M. Wenn, Roy. Free; M. H. G. White, Middlesex; D. I. Williams, King's Coll.; G. M. Woddis, St. Bart.'s; R. C. Wofinden, St. Mary's; N. P. Woodgate-Jones, Middlesex; M. R. Woods, Guy's; George Wynn-Williams, King's Coll. and Westminster; G. E. Yardley, Guy's; F. H. Yates, St. Bart.'s; A. L. Young, Oxon and Guy's; and S. S. Yudkin, Univ. Coll.

Diplomas were granted, jointly with the Royal College of Surgeons, to the following candidates:—

Tropical Medicine and Hygiene.—R. M. Abraham, E. E. Barnett, H. B. F. Dixon, I. K. El Lamii, W. J. Pinto, G. B. Smart, and P. W. Vilain.

Diplomas in anæsthetics were also granted to those candidates mentioned in THE LANCET of Dec. 19th, p. 1497, and diplomas in public health, psychological medicine and laryngology and otology to those mentioned in THE LANCET of Jan. 23rd, p. 242.

University of Edinburgh

At a recent meeting of the university court it was announced that the University Grants Committee had offered a non-recurrent capital grant, up to a maximum of £15,000, towards the cost of building a students' union for men and women on the King's Buildings site at Westmains-road. The building will include a refectory and gymnasium. The total cost is estimated at £20,000 and the committee offered a grant on condition that the balance is obtained from other sources and that the scheme is proceeded with as soon as possible—in any case, within two years. The present students' unions are too far from the New University at King's Buildings for them to be of much value to the increasing number of students who spend a large part of their day in the new buildings.

Scottish Conjoint Board

At recent examinations by the board of the Royal Colleges of Physicians and of Surgeons of Edinburgh and the Royal Faculty of Physicians and Surgeons of Glasgow, the following candidates were successful:—

Kurt Aaron, A. M. Allison, Albert Blanshaft, A. E. R. Chalmers, S. F. Cranston, *Hester J. Davies, James Drake, A. A. Esser, Philippe Evreniades, *E. W. Finkle, D. G. Hanton, *L. B. Hardman, I. L. Jacobs, William Jonas, Leo Kroll, Dean Lederfeind, M. E. Lee-Abbott, *Zotlan Leitner, W. J. Low, James McGibbon, J. M. MacGregor, Manuel Manella, Moritz Meyer, W. B. Meyer, Lorenz Michaelis, D. B. Milne, M. N. Mitra, K. F. Nagelschmidt, Reuben Naftalin, Hugh O'Hara, E. A. Perera, H. J. Phin, F. O. Piorkowski, J. E. Price, K. M. Regensburger, M. W. Rosenthal, Allen Rumelt, Martin Scholtz, Harold Sherry, F. F. Truax, Demetrios Varvaressos, Lena Walker, *B. A. M. Williamson, H. A. J. Wolff, and Harry Zeller.

* In absentia.

Empire Tuberculosis Conference

A conference on the care and after-care of the tuberculous is to be held at Overseas House, St. James's, from May 3rd to 8th, under the auspices of the Overseas League and Papworth Village Settlement. The subject for the first day is the Fight against Tuberculosis throughout the Empire, to be introduced by Sir Kingsley Wood and Prof. S. Lyle Cummins; for the second day, the After-care of the Tuberculous throughout the Empire, to be introduced by Sir Pendrill Varrier-Jones and Dr. B. A. Dormer; on the third day Lieut.-Colonel G. G. Jolly, I.M.S., and Dr. P. V. G. Benjamin will introduce the subject of the Native Races and Tuberculosis throughout the Empire. At a recent informal meeting Lord Willingdon, who will preside at the conference, explained what an unrivalled opportunity the Coronation offered of getting together interested people from all parts of the Empire. Sir Pendrill said that, as tuberculosis had been introduced by the white man to races which had hitherto been free from it, it was part of our Imperial responsibility to combat the disease on every front, social and economic as well as medical. Little progress would be made, he felt, unless the victims of tuberculosis were given an opportunity of working and earning in a suitable environment. Prof. Cummins spoke of the conference as an essential step to the better comprehension of the problem of preventing and curing tuberculosis in the native populations which had shown themselves intensely susceptible to tuberculosis when brought under industrial conditions. A preliminary programme of the conference may be had from the hon. secretary, Empire Conference (Tuberculosis), Overseas House, St. James's, London, S.W.1.

University of Liverpool

On Thursday, Feb. 11th, Mr. Walter Mercer, lecturer in clinical surgery in the University of Edinburgh, will deliver the Lady Jones lecture in orthopædic surgery to the University. He will speak at 4 P.M. in the medical school, and his subject will be anomalies of the fifth lumbar vertebræ. The lecture is open to members of the medical profession.

Royal Society of Medicine

At 8.30 P.M. on Thursday, Feb. 11th, Sir John Parsons, F.R.S., the president, will receive fellows of the Royal Society of Medicine and their friends at the society's house, 1, Wimpole-street, W. At 9.15 P.M. Dr. T. Graham Brown, F.R.S., professor of physiology in the University of Wales, will give an illustrated address on mountain-climbing in three continents.

Improvement of Eyesight

Opening the Exhibition of Ophthalmic Goods and Equipment at the Royal Horticultural Hall last Tuesday, Sir Kingsley Wood, Minister of Health, said that though the total amount of eye deficiency showed little sign of abating, the incidence had to some extent been shifted to the later years of life, and much was being done in the prevention of blindness. He mentioned that whereas before the late war some 90 per cent. of the spectacle lenses used in this country were of foreign manufacture, the proportion had now fallen to about 25 per cent.

Association of Industrial Medical Officers

The sixth meeting of this association was held at the London School of Hygiene on Jan. 22nd, Dr. N. Howard Mummery being in the chair.—Prof. Millais Culpin discussed the recent development of medical psychology, showing how it represented in some ways a return to earlier conceptions, with a swing of the pendulum towards the recognition of psychological factors. Sickness incidence varied in its diagnostic distribution in accordance with fashion, neuritis and traumatic neurasthenia for example tending to disappear. He remarked on the curious inability to diagnose common psychoneurotic conditions. There were medical men who repudiated the psychological point of view and were therefore prone to miss such cases and to live in a happy state of unjustified certainty.—Miss May Smith, D.Sc., described the historical evolution of modern industrial psychology, and put forward a plea for a more intelligent understanding of the human factor in industrial medical practice. The industrial medical officer, she maintained, should be the main link between industry and the work of the Industrial Health Research Board.

At the quarterly dinner held the same evening in the School of Hygiene, Dr. Mummery was presented with an inscribed silver tray on his retirement from the chairmanship. In making the presentation Prof. W. W. Jameson paid tribute to his pioneer work after the war in the establishment of the modern industrial clinic. Dr. Leonard P. Lockhart succeeds Dr. Mummery in the chair.

The People's League of Health

At a luncheon on Jan. 19th in the Savoy Hotel, London, Lord Leverhulme asked for the coöperation of the press and of the officers of the People's League of Health in its first national appeal. The League, he said, was founded in 1917 by Miss Olga Nethersole, and its objects were expressed by the adage "prevention is better than cure." It was trying to remove the disease, wastage, and suffering that were due to ignorance and to bad environment and nutrition. To this end the League published a great variety of authoritative pamphlets, disseminated leaflets, and posters, promoted health weeks and exhibitions, instituted courses of lectures at various centres, and had awarded eleven travelling scholarships. Through its inquiry bureau it was helping individuals and institutions seeking advice on matters of health and the prevention of disease. Special committees had investigated specific problems, and when the League's findings were conclusive, they had been impressed upon the Government by various deputations such as those on the effects of unemployment on juvenile delinquency, and on noise. Other important inquiries included those into tuberculosis and milk, leading to the safe milk campaign, and

into the effect of diet on maternal mortality and morbidity. Turning to the future, Lord Leverhulme said that hitherto the work of the League had depended upon the annual subscriptions of only a comparatively few supporters. The League wanted to enlarge its work, to develop the information bureau into a national central almoner service that could supply to the country generally the help given by hospital almoners, and to investigate further problems, such as the conditions under which infants and young children are received by foster-parents, and the extent of bovine tuberculosis in children by means of a survey of crippledom throughout the country.

The League's national appeal would be launched at a banquet at the Guildhall on April 15th, at which the Lord Mayor would preside. King George V had been patron of the League and had given the appeal his gracious approval, for he and Queen Mary had graciously headed the list of donations with gifts of £100 and £50 respectively.

Samaritan Free Hospital for Women

On Friday, Feb. 12th, at 4 P.M., Viscount Dawson of Penn will open the new deep X ray therapy and radiology department of this hospital. Sir Ewen Maclean, president of the College of Obstetricians and Gynæcologists, and Dr. A. W. Oxford, chairman of the hospital, will also speak.

Advice on Birth Control

On Feb. 2nd the Minister of Health received a deputation organised by the National Birth Control Association introduced by Lord Horder. The other speakers included the Countess of Limerick, Dr. Jocelyn Moore, Mr. Cedric Lane-Roberts, M.S., Lady Denman, and Mrs. Freeth, and they urged that increased provision of gynæcological clinics at which contraceptive advice was available would lead to a reduction, not only in maternal morbidity and mortality but in criminal abortion. The Minister, they held, should issue a circular to local authorities encouraging them to establish gynæcological clinics in which birth control should take its proper place as part of the general medical care of women; it was important that the work should be carried out as an integral part of the local authorities' maternity and child welfare schemes. In reply, Sir Kingsley Wood said he recognised the force of many of the arguments advanced; but both Minister and local authorities were bound to observe the limitations imposed by Parliament. Local authorities, for instance, had at present no legal power to provide birth control clinics as such, and there was no statutory duty upon them to provide advice or medical assistance in relation to birth control. A clinic provided under the Maternity and Child Welfare Act could not lawfully be used for any woman who was not an expectant or nursing mother. Clinics provided under the Public Health Acts, on the other hand, were open to any sick woman who might attend for advice and treatment. Apart from these two Acts there was no statutory authority for the establishment of clinics providing for the facilities suggested by the deputation. Sir Kingsley also pointed out that the maternity and child welfare centres were not ordinarily designed or equipped for general gynæcolbgical work or as a place for the treatment of sick women. But if they were, their preventive functions might be impaired by being mixed up with work which usually needed the resources of a hospital for its adequate performance. He hoped shortly to receive the report of the last two years' investigation into maternal mortality, and he had little doubt that one of the most important recommendations of the investigators would relate to the need for an extension of postnatal clinics. At these clinics birth control advice could lawfully be given to any woman in whose case pregnancy would be detrimental to health, but it was desirable that such advice should be given at a separate session. The establishment of postnatal clinics would no doubt show the need in many areas for providing gynæcological clinics for the treatment of disabilities and diseases which were discovered at the postnatal clinics and which could not be adequately treated there. These clinics must be provided under the Public Health Acts, they would be available for any woman suffering from gynæcological conditions, and birth control advice could lawfully be given there if pregnancy would be detrimental to health.

Biochemical Society

A meeting of this society will be held at the Glaxo Laboratories, Greenford, Middlesex, on Friday, Feb. 12th, at 3.30 P.M., when short communications will be read.

Institute of Psycho-Analysis

Three public lectures will be given on Feb. 10th, 12th, and 15th at 8.30 P.M., at 96, Gloucester-place, London, W., by Dr. Geza Roheim, of Budapest. He will speak on the psycho-analysis of primitive social relations, basing his address on field work in Central Australia and Papua. Tickets may be obtained at the door.

More and Safer Milk

On Monday last Sir Kingsley Wood, the Minister of Health, visited Romford to institute a Milk Week. He pointed out that in Great Britain the consumption of milk amounts to less than half-a-pint per head per day and that it could with advantage be doubled. The milk-in-schools scheme was in operation in nearly all the public elementary schools in the large towns of this country, and in the country as a whole in schools containing over 90 per cent. of the elementary school population. But rather less than half the children were taking advantage of it. This was due not so much to poverty as to indifference on the part of some parents and lack of appreciation of milk on the part of some of the children. Interesting experiments, he added, were now in operation in the distressed areas. At Rhondda and Jarrow milk was being supplied to nursing and expectant mothers and children under school age at a reduced cost, and at the end of the year at Rhondda over 4000 persons were availing themselves of this new scheme. In all endeavours to make the nation milk-conscious it should be remembered that the vital member of the household was the mother, but it was important that the needs of the workers—particularly the younger generation—should be studied, and that employers should continue to encourage the consumption of milk in the factories. Sir Kingsley also remarked that the more the consumption of milk was increased, the more important did it become to ensure the safety of the supply.

Medical Diary

Information to be included in this column should reach us in proper form on Tuesday, and cannot appear if it reaches us later than the first post on Wednesday morning.

SOCIETIES

ROYAL SOCIETY OF MEDICINE, 1, Wimpole-street, W.

TUESDAY, Feb. 9th.

Psychiatry and Medicine. 8.30 P.M. Prof. F. L. Golla and Sir Walter Langdon-Brown: Relation Between Mental Disorder and the Activities of Endocrine Glands.

FRIDAY.

Clinical. 5.30 P.M. (Cases at 4.30 P.M.). Mr. George Mason: 1. Angina Pectoris Treated by Cardio-omentopexy. 2. Cases of Bronchiectasis Treated by Pneumonectomy. Dr. Terence East: 3–4. Pick's Syndrome. Mr. A. E. Porritt: 5. Endothelioma of Tibia, with Pathological Fracture. Mr. H. E. Mansell: 6. Angina Pectoris Treated by Cardio-omentopexy.

Ophthalmology. 8.30 P.M. (Cases at 8 P.M.). Sir Arthur Hall: Concerning the Acts of Closing and Opening the Eyes. (Film and lantern slides.)

MEDICAL SOCIETY OF LONDON, 11, Chandos-street, W.

MONDAY, Feb. 8th.—8.30 P.M., Dr. Macdonald Critchley, Mr. T. P. Kilner, and Mr. Terence Cawthorne: Treatment of Facial Paralysis.

MEDICAL SOCIETY OF INDIVIDUAL PSYCHOLOGY.

THURSDAY, Feb. 11th.—8.30 P.M. (11, Chandos-street, W.), Dr. Emanuel Miller: Introduction to Life (Symposium on Mental Health in Childhood and Adolescence, No. 2).

NORTH LONDON MEDICAL AND CHIRURGICAL SOCIETY.

FRIDAY, Feb. 12th.—4 P.M., Visit to Colindale Hospital for Tuberculosis, Hendon.

PADDINGTON MEDICAL SOCIETY.

TUESDAY, Feb. 9th.—9 P.M. (St. Mary's Hospital Medical School), Dr. Russell J. Reynolds: Lecture Demonstration on Cineradiography.

SOUTH-WEST LONDON MEDICAL SOCIETY.

WEDNESDAY, Feb. 10th.—9 P.M., Dr. Horace Evans: *B. coli* Infections of the Urinary Tract.

WEST KENT MEDICO-CHIRURGICAL SOCIETY.

FRIDAY, Feb. 12th.—8.45 P.M. (Miller General Hospital, Greenwich), Dr. Anthony Feiling: The Eye in General Medicine.

LECTURES, ADDRESSES, DEMONSTRATIONS, &c.

ROYAL COLLEGE OF SURGEONS, Lincoln's Inn Fields, W.C.
MONDAY, Feb. 8th.—5 P.M., Mr. A. R. D. Pattison: Cushing's Syndrome.
WEDNESDAY.—5 P.M., Mr. D. W. C. Northfield: Headache.
FRIDAY.—5 P.M., Mr. F. H. Bentley: Experimental Nerve Anastomosis. (Hunterian lectures.)

UNIVERSITY OF LONDON.
TUESDAY, Feb. 9th.—5.30 P.M. (St. Mary's Hospital Medical School), Prof. E. D. Telford: Some Disorders of the Peripheral Circulation. (First of three lectures.)

UNIVERSITY OF LIVERPOOL.
THURSDAY, Feb. 11th.—4 P.M. (Medical School), Mr. Walter Mercer: Anomalies of the Fifth Lumbar Vertebra: Reflections and Experiences. (Lady Jones lecture.)

GRESHAM COLLEGE, Basinghall-street, E.C.
TUESDAY, Feb. 9th, and WEDNESDAY, THURSDAY, and FRIDAY.—6 P.M., Dr. J. Alison Glover: Inanimate Vehicles of Infection.

BRITISH POSTGRADUATE MEDICAL SCHOOL, Ducane-road, W.
MONDAY, Feb. 8th.—2.30 P.M., Dr. H. MacLean: Nephritis and Allied Conditions.
TUESDAY.—2 P.M., Dr. J. Grey: Pathology of the Gall-bladder.
WEDNESDAY.—Noon, clinical and pathological conference (medical). 2.30 P.M., clinical and pathological conference (surgical). 4.30 P.M., Mr. A. S. Parkes, F.R.S.: Experimental Endocrinology.
THURSDAY.—Noon, clinical and pathological conference (obstetrics and gynæcology). 2.30 P.M., Dr. Duncan White: radiological demonstration. 3.30 P.M., Mr. A. K. Henry: Demonstrations on the Cadaver of Surgical Exposures. 3.30 P.M., Dr. A. A. Moncreiff: Feeding of the New-born Infant (Breast and Artificial), Care of the Premature Infant.
FRIDAY.—2 P.M., operative obstetrics. 2.30 P.M., Prof. E. Hey Groves: Fractures. 3 P.M., department of gynæcology, pathological demonstration.
Daily, 10 A.M. to 4 P.M., medical clinics, surgical clinics and operations, obstetrical and gynæcological clinics and operations.

WEST LONDON HOSPITAL POST-GRADUATE COLLEGE, Hammersmith, W.
MONDAY, Feb. 8th.—10 A.M., skin clinic. 11 A.M., surgical wards. 2 P.M., operations, surgical and gynæcological wards, medical, surgical, and gynæcological clinics. 4.15 P.M., Mr. Arnold Walker: Ante-partum Hæmorrhage.
TUESDAY.—10 A.M., medical wards. 11 A.M., surgical wards. 2 P.M., operations, medical, surgical, and throat clinics. 4.15 P.M., Dr. Hugh Gordon: Baldness.
WEDNESDAY.—10 A.M., children's ward and clinic. 11 A.M., medical wards. 2 P.M., gynæcological operations, medical, surgical, and eye clinics. 4.15 P.M., Dr. Grainger Stewart: Compression Paraplegia.
THURSDAY.—10 A.M., neurological and gynæcological clinics. Noon, fracture clinic. 2 P.M., operations, medical, surgical, and genito-urinary and eye clinics. 4.15 P.M., Mr. Sangster Simmonds: Diseases of the Alimentary Tract.
FRIDAY.—10 A.M., medical wards, skin clinic. Noon, lecture on treatment. 2 P.M., operations, medical, surgical, and throat clinics. 4.15 P.M., Dr. Sydney Owen: Meningitis.
SATURDAY.—10 A.M., children's and surgical clinic. 11 A.M., medical wards.
The lectures at 4.15 P.M. are open to all medical practitioners without fee.

FELLOWSHIP OF MEDICINE AND POST-GRADUATE MEDICAL ASSOCIATION, 1, Wimpole-street, W.
MONDAY, Feb. 8th, to SATURDAY, Feb. 13th.—ST. JOHN'S HOSPITAL, Leicester-square, W.C., afternoon course in dermatology (open to non-members).—NATIONAL TEMPERANCE HOSPITAL, Hampstead-road, N.W. Tues., 8.30 P.M., Mr. R. A. Fitzsimons: Infection of Bones. Thurs., 8.30 P.M., Mr. W. E. Underwood: Diseases of and Injuries to Joints, Muscles, and Tendons.—CHELSEA HOSPITAL FOR WOMEN, Arthur-street, S.W., all-day course in gynæcology.—Courses arranged by the fellowship are open only to members.

HOSPITAL FOR SICK CHILDREN, Great Ormond-street, W.C.
THURSDAY, Feb. 11th.—2 P.M., Dr. Donald Paterson: Therapeutic Measures in Acute Gastro-enteritis. 3 P.M., Dr. Bertram Shires: Radiation and Light Therapy.
Out-patient clinics daily at 10 A.M., and ward visits at 2 P.M.

NATIONAL HOSPITAL, Queen-square, W.C.
MONDAY, Feb. 8th.—3.30 P.M., Dr. Symonds: Cerebral Tumours (II).
TUESDAY.—3.30 P.M., Dr. Carmichael: Muscular Dystrophy and Dysfunction.
WEDNESDAY.—3.30 P.M., Dr. Kinnier Wilson: Clinical Demonstration.
THURSDAY.—3.30 P.M., Mr. Jefferson: Spinal Injuries.
FRIDAY.—3.30 P.M., Dr. Denny-Brown: The Motor Cortex.
Out-patient clinic daily at 2 P.M.

CENTRAL LONDON THROAT, NOSE, AND EAR HOSPITAL, Gray's Inn-road, W.C.
FRIDAY, Feb. 12th.—4 P.M., Mr. W. A. Mill: Earache in the Normal Ear.

LONDON SCHOOL OF DERMATOLOGY, 5, Lisle-street, W.C.
TUESDAY, Feb. 9th.—5 P.M., Dr. H. T. Barron: Common Skin Diseases in Childhood.
WEDNESDAY.—5 P.M., Dr. I. Muende: Histopathology of Some Common Skin Diseases.
THURSDAY.—5 P.M., Dr. G. B. M. Heggs: Some Affections of the Skin of the Foot.

NATIONAL HOSPITAL FOR DISEASES OF THE HEART, Westmoreland-street, W.
TUESDAY, Feb. 9th.—5.30 P.M., Dr. B. T. Parsons-Smith: Angina Pectoris.

SOUTH-WEST LONDON POST-GRADUATE ASSOCIATION, St. James' Hospital, Ouseley-road, S.W.
WEDNESDAY, Feb. 10th.—4 P.M., Mr. J. G. Yates Bell: Prostatic Obstruction.

ST. JOHN CLINIC AND INSTITUTE OF PHYSICAL MEDICINE, Ranelagh-road, S.W.
FRIDAY, Feb. 12th.—4.30 P.M., Dr. Albert Eldinow: The Indications for Light Therapy in the Rheumatic Diseases.

LEEDS GENERAL INFIRMARY.
TUESDAY, Feb. 9th.—3.30 P.M., Mr. Symons: Demonstration of Surgical Cases.

ANCOATS HOSPITAL, Manchester.
THURSDAY, Feb. 11th.—4.15 P.M., Clinical Meeting.

ST. MARY'S HOSPITALS, Manchester.
THURSDAY, Feb. 11th.—4.15 P.M. (Whitworth-street West Hospital), Dr. E. A. Gerrard: Hæmorrhage Complicating Pregnancy and Labour.

GLASGOW POST-GRADUATE MEDICAL ASSOCIATION.
WEDNESDAY, Feb. 10th.—4.15 P.M. (Royal Samaritan Hospital for Women), Dr. Donald McIntyre: Gynæcological Cases.

Appointments

CRAN, B. S., M.D. Aberd., F.R.C.S. Edin., has been appointed Surgical Officer and Superintendent at the Belford Hospital, Fort William.

GILPIN, A., M.D., M.R.C.P. Lond., Consulting Physician to the King Edward Memorial Hospital, Ealing.

HAWKSLEY, J. C., M.D., M.R.C.P. Lond., Consulting Physician to the King Edward Memorial Hospital, Ealing.

LEWIS, R. S., B.A. Camb., F.R.C.S. Eng., Hon. Surgical Registrar to the Royal Waterloo Hospital.

RALPHS, F. G., M.B. Manch., F.R.C.S. Edin., H.M. Coroner, County of Lancaster.

STUHL, F. J. E., M.A. Camb., L.R.C.P. Lond., Junior Male Assistant Medical Officer at the Birmingham City Mental Hospital.

TENNENT, THOMAS, M.D. Glasg., M.R.C.P. Lond., D.P.H., D.P.M., Assistant Physician in Psychological Medicine to King's College Hospital.

Certifying Surgeons under the Factory and Workshop Acts: Dr. P. CAMPBELL (East Kilbride District, Lanark); Dr. E. M. E. CUMMING (Glasgow, West District, Lanark); and Dr. N. PICK (Barnsley District, Yorks, W.R.).

Births, Marriages, and Deaths

BIRTHS

BRYAN.—On Jan. 29th, at St. George's-square, S.W., the wife of Dr. T. B. L. Bryan, of a son.

BUXTON.—On Jan. 16th, at West Bitchfield, Belsay, Northumberland, the wife of R. J. Buxton, B.Chir., D.O.M.S., of a daughter.

MCGREGOR.—On Jan. 27th, the wife of Dr. H. G. McGregor, of Worthing, of a daughter.

PEGG.—On Jan. 17th, at Calcutta, the wife of Mr. A. D. Pegg, F.R.C.S., of a son.

VAUGHAN PAYNE.—On Jan. 28th, 1937, the wife of R. Vaughan Payne, M.Ch., F.R.C.S., of Windsor, of a daughter.

MARRIAGES

BEYNON—TAYLOR.—On Jan. 23rd, at Dunkeld Cathedral, Dr. Lewis John Beynon to Constance Lang, second daughter of Dr. J. A. Taylor, of Dunkeld.

ELLIS—ROBINSON.—On Jan. 28th, in London, Valentine Herbert Ellis, F.R.C.S. Eng., to Angela Peart Robinson.

DEATHS

DAVY.—On Jan. 31st, at Corringham-road, Golders Green, N.W., Rose Lilian Humphrey Davy, M.B. Lond., D.P.H.

HOLT.—On Jan. 31st, at Bournemouth, Henry Holt, M.D. Leeds, of Bournemouth, late of Stockport.

SCHACHT.—On Jan. 21st, at Winscombe, Somerset, Franc Frederic Schacht, M.D. Camb., aged 80.

SOMMERVILLE.—On Jan. 30th, David Sommerville, M.D. Belf., M.R.C.P. Lond., of Caterham, aged 74.

THORBURN.—On Jan. 27th, at Peshawar, N.W.F.P., Colonel Harold Hay Thorburn, C.I.E., M.B. Edin., I.M.S., aged 54.

VINE.—On Jan. 29th, A. Bertram Vine, M.B.E., M.B. Lond., of Bury.

N.B.—A fee of 7s. 6d. is charged for the insertion of Notices of Births, Marriages, and Deaths.

NOTES, COMMENTS, AND ABSTRACTS

THE FUTURE STATUS OF THE CLINICAL PATHOLOGIST *

By S. C. Dyke, D.M., F.R.C.P.

PATHOLOGIST TO THE ROYAL HOSPITAL, WOLVERHAMPTON; CLINICAL PATHOLOGIST TO THE GENERAL HOSPITAL, WALSALL

The declared and avowed clinical pathologist is a comparatively recent entrant into the field of medicine in this country; I suppose that in the whole of Great Britain and Ireland there are not more than 250 medical men and women who would regard themselves as falling within the category. The number is growing and seems likely to continue to do so; the time is ripe for a consideration of the sphere of the clinical pathologist, of the sort of training required to fit him for his work, and of his status in relation to his fellow medical practitioners.

Clinical pathology may be defined as the application of pathology and of the methods of pathology to clinical medicine. Time was when all pathology was more or less clinical and many of the founders of British medicine might be described as clinical pathologists; Bright, Addison, Hunter, Gull, and Sutton, and many others fall within the terms of the definition. But since the days of the giants of old a gulf has opened between clinical medicine and pathology. Some pathologists have tended to pursue the study of their subject for its own sake and without reference to clinical medicine, and some clinicians have shown a reluctance—often amounting to a positive aversion—to admit the application of the methods of pathology to clinical medicine.

As an example, incredible though it may sound, I lately heard an eminent physician address an audience of medical men and women for a full hour and a half on the subject of "obscure pyrexia" without once making mention of any laboratory method. Even in the diagnosis of coliform infection of the urinary tract his recommended methods of investigation did not pass beyond the observation of smell and naked-eye appearance of the urine.

THE CLINICAL PATHOLOGIST AS SPECIALIST

It is the aim of clinical pathology to enlarge and extend the boundaries of clinical observation beyond those attainable by the unaided senses. In its own sphere it endeavours to introduce scientific precision into medicine. The question whether or not medicine is a science has on occasion served as a subject of rather futile debate. In so far as it is founded upon a body of reasoned knowledge and systematised experience it is a science. The reasoning upon which some of of our present-day medical practice is based will probably not for ever appear sound, and its supposed fundamentals will require alteration and amendment; but this is a state of affairs common to all sciences, even the mathematical, the principles of which not so long ago appeared to be immutably fixed for all time to come.

So far as medicine is a science it is founded upon physiology and upon pathology, which is morbid physiology. The sphere of clinical pathology is the practice and pursuit of pathology, and therefore of physiology, in so far as they come into contact with clinical medicine. The extent to which they will so come into contact must increase with the progressive establishment of medicine upon the basis of science.

But pathology and physiology form a large part of the medical curriculum and are common ground to all those who endeavour to practise medicine in a spirit of other than pure empiricism. Something more than a knowledge and appreciation of the relation of these subjects to clinical medicine is necessary for the clinical pathologist. Not only must he know the theory but he must in addition have full mastery of the technique of his subject; that technique is largely that of the laboratory.

It is the existence of this technique which makes it necessary to regard clinical pathology as a special branch of medicine. Whether its practitioners should rightly be regarded as "specialists" is a matter of no great moment. The best definition of this much-abused term with which I am acquainted I heard from Sir Cuthbert Wallace; it was, if I remember rightly, to the effect that only those should be regarded as specialists who have the mastery of some special technique. In the case of the clinical pathologist the technique is that of the laboratory and he falls within the terms of the definition.

A mastery of laboratory technique is neither easily nor quickly acquired. In certain teaching schools the belief appears to prevail that by virtue of a short course of tuition in laboratory methods the student will after qualification be in a position to apply for himself and upon his own patients the methods of laboratory diagnosis. Personally I believe this to be a fallacy and the time spent in instructing the medical student in the technique of laboratory methods to be largely wasted. It is essential that the medical man have a general idea of the nature and scope of these methods in the study of disease, that he should understand their practical applications in diagnosis, and in particular that he should harbour a lively sense of their limitations in that field. The most assiduous application over a few months to a course of instruction practical and otherwise cannot, however, make a medical student into a skilled laboratory worker—much less endow him with a full knowledge of the application and interpretation of the results of diagnostic laboratory work. Furthermore, few medical men engaged in clinical practice have the time to devote themselves personally to the application of any but the simplest laboratory methods to their own cases. That this is so is probably not all to the bad. Could and would every medical man study his own cases in his own laboratory it would undoubtedly add interest to practice, just as interest is added to that practice in which the practitioner is his own surgeon. But by common consent such an arrangement is not always in the best interests of the patient. The same I believe to apply to clinical pathology.

The technique of the diagnostic laboratory is the special field of the clinical pathologist and the laboratory must play a large part in his training. The medical student who is drawn to the practice of this specialty will almost certainly have paid particular attention to physiology and will have more than a speaking acquaintance with the technique of that science. A thorough grounding in the technique of physiology will carry him far in the clinical pathological laboratory. The technique of biochemistry and histology will present little unfamiliar; that of bacteriology and serology will not be entirely strange.

* Presidential address to the Association of Clinical Pathologists on Jan. 29th.

I think that the ideal department for the training of the clinical pathologist is that in which all the laboratory diagnostic work and the post-mortem service of a general hospital is conducted under one head; in such a department the danger of undue specialisation on any one branch is easily avoided; this is not so easy in larger institutions in which specialisation has led to the formation of separate and distinct departments, but even in the face of such departmentalisation coördination can be and often is maintained.

THE CLINICAL PATHOLOGIST AS CLINICIAN

It is his mastery of his special technique that is the excuse for the existence of the clinical pathologist. Also it is essential that he be more than a mere specialist. The dangers of "narrow specialisation" in all branches of medicine are now so widely apparent that it is not necessary to dilate upon them. If he is to fill his proper sphere the clinical pathologist must by all means avoid these dangers. A thorough acquaintance with clinical medicine is as necessary to him as it is to the surgeon, the cardiologist, the ophthalmologist, or the practitioner in any other special branch of medicine. Clinical pathology has no place for the pure laboratory bench worker. He has a place and a very honoured place in other branches of pathology; but clinical pathology is only partly a matter of the laboratory bench; equally it has its place in the wards and at the bedside.

Without a thorough knowledge of the problems of clinical medicine the clinical pathologist is in no position to fulfil the whole of his function and such knowledge is only to be acquired in the wards. His place is not wholly in the laboratory, and routine work at the bench is not his business; he must himself have performed and be thoroughly familiar with every detail of all procedures carried out in his laboratory; unless he has done so he is in no position to supervise their performance by others. Routine work can, however, equally well be done by skilled laboratory technicians and is a waste of the time of the experienced clinical pathologist. His business as the head of his department is its direction and supervision. And that is not the whole of his business.

It is further his part to see that his department is used to the fullest and best advantage of the community which it serves, be that community a hospital, a congerie of medical men, or both. The capacity to do this demands more than skill and experience in laboratory work. The clinical pathologist must be able to act as a guide to the uses of his own department and to the interpretation of the results obtained in it. To act as a guide he must know the geography of the avenues of approach most likely to lead to the solution of any given diagnostic problem. Such knowledge comes only from acquaintance with the natural history of disease; without such knowledge the clinical pathologist will be but a blind guide. That he may be able to deal with this aspect of his work it is essential that in addition to his special skill and experience in laboratory technique he possess a full knowledge of clinical medicine; the wards as well as the laboratory must constitute his training ground.

My own training was acquired in the wards and the laboratories of the clinical units of St. Thomas's Hospital; in my present department at The Royal Hospital, Wolverhampton, it has been my endeavour to carry on the spirit which animated the units in my time. At The Royal Hospital the assistant pathologist fills also the post of resident medical officer and is charged with maintaining the closest possible liaison between the laboratory and the wards. The arrangement works well so far as the laboratory is concerned; from the approval which it has gained from my colleagues on the honorary staff I believe it to be advantageous to the clinical work of the hospital and from the comments of those who have held the joint post I believe it to provide a satisfying though far from an easy life.

Some such combined post is, I think, ideal for the training of the clinical pathologist. By placing in the hands of the same observer the supervision both in the wards and in the laboratory of the investigation of any given case it affords the fullest opportunity for the intelligent correlation of ward and laboratory findings; in the capacity of assistant pathologist the holder of the post will perform or assist at all post-mortem examinations and is thus afforded the opportunity of verifying (or otherwise) deductions from findings during life. Clinical observations, laboratory data, and post-mortem findings are checked against each other by the same person and all in the same department. In this way an accuracy, a continuity, and a completeness of observation can be applied to the study of any given case which would I think have satisfied the ideal of my first master in medicine, the late Sir William Osler.

Given a well-equipped and properly staffed pathological department I believe such a post as outlined to afford the best possible training ground for the clinical pathologist. Furthermore, by assuring so far as is humanly possible the full and proper use of the diagnostic facilities of the laboratory it is manifestly advantageous to the clinical work of the hospital.

The University of London some years ago, largely at the instance of the Association of Clinical Pathologists, established a diploma in clinical pathology. This diploma will in future serve as the mark of the trained clinical pathologist and the time may well come when its possession will be as essential to the candidate for the post of hospital pathologist as that of the "fellowship" is for the aspirant to a place on the surgical staff. As evidence, however, of his capacity to take his proper place and to fulfil his rôle in his own medical community, the complete clinical pathologist will wish also to possess some one of the higher post-graduate distinctions in clinical medicine.

Thus trained and equipped he will be in a position to fill his proper sphere. In order that the fullest and most advantageous use be made of his special skill and knowledge it is essential that along with his fellow specialists in other branches of medicine he takes his place both in the counsels of the institution to which he is attached and in consultation at the bedside as well as in the laboratories.

PATIENT OR MATERIAL FROM PATIENT?

Lord Horder recently spoke of the clinical pathologist as substituting for the study of the patient "qua patient" that of "material derived from the patient." I hope I have made it clear that this is diametrically opposed to the view of their subject held by its own practitioners. The clinical pathologist does indeed study material derived from the patient and brings to that study the aid of a special technique; to him, however, his laboratory findings form only a part of the pattern of the case and he realises that unless considered in their proper relationship to the whole picture they may be of little

value, sometimes worthless, and not rarely actually misleading.

It is not as a rule the clinical pathologist who draws diagnostic deductions from the recovery on culture of organisms from an otherwise normal urine or who diagnoses "typhoid fever" from a "positive Widal reaction" without reference to titre or the general state of the patient; it is not he who orders a vaccine made up from the normal fauna and flora of the fauces or bowel, nor is it he who will administer it. But in all these things and more he may and does see his work misapplied and his name taken in vain.

It used to be the fashion to speak of pathology as a science "ancillary" to medicine, and there was at one time a tendency to treat its practitioners, not so much as "hand-maidens" as general drudges to the lords of medicine. Our first president, the late Prof. C. Powell White, throughout his working life fought both with tongue and pen against this attitude. If clinical pathology is ancillary to medicine it is ancillary in the same way and to the same degree as any other special branch is ancillary to medicine as a whole. Clinical pathology has its own contribution to make towards and its own part to play in the entelechy of medicine. It is the business of the members of the Association of Clinical Pathologists to see to it that its contribution is made fully and its part effectively played.

A PSYCHOTHERAPIST'S TRAINING

In his presidential address delivered to the British Psychological Society (Medical Section) on Jan. 27th, Dr. H. Crichton-Miller prefaced his remarks on the Frontiers of Psychotherapy by reviewing his own professional experience, from which the contribution he proposed to make from the presidential chair was derived. He proceeded: In another place I have expressed my belief that it would be for the good of all concerned if by a Utopian scheme of medical education and practice we could have a probationary period in general practice of, say, five years, after qualification and before specialising in psychotherapy. The ten years that I spent in general practice taught me many things that I would not have learned otherwise and taught me much that is not being taught to the aspiring psychotherapist of to-day. We are all aware of the danger of narrowness in any specialised department of treatment: these dangers are essentially psychological in character; if we psychologists are content to live and practise in blinkers, we are in no position to point out to others the restriction of their field of vision.

The second element in my experience to which I owe much is that I have worked for over a quarter of a century in a nursing-home which I started solely for the treatment of psychoneurotics. There I have seen various psychotherapeutic techniques in operation under favourable conditions. There I have seen the intangible effects of atmosphere, a therapeutic agent as elusive as vitamins and hardly less essential. There I have been able to evaluate the results of thorough physical treatment on a scale that I can look back on without shame. There, finally, I have learned how impossible it is to manufacture a psychological nurse, and how deplorably low is the birth-rate of this breed.

The third element to which I owe much is professional work in the war. And no one could go through those years without learning lessons about repression and valour, stupidity and vanity, not to mention other aspects of the human psyche.

The fourth element which has enriched my professional experience is the Institute of Medical Psychology, which I started in 1920 as the Tavistock Clinic. For 13 years I acted as director and during that time we passed through the lean years of psychotherapy—say, 1925–30, when professional approval was still grudging and the Mayfair vogue had waned. In those 13 years I had unusual opportunities of observing the frontier activities of psychotherapy with general practice, with psychiatry, with education, and with religion. Furthermore, I was in a position to observe and assess the therapeutic value of a considerable number of junior colleagues. In this connexion I recall certain painful conversations in which I was reluctantly obliged to point out to a zealous aspirant that he or she—as the case might be—was not sufficiently promising to begin, or not sufficiently successful to continue, to work with us. Of the victims of what the modern undergraduate would call "sadistic dictatorship," some have reverted to general medicine without bearing me any malice; some clearly cherish resentment to this day and one—after a lapse of ten years—has forgiven me by reason of a Group Movement conversion. From this last instance I deduce, and would have you deduce, that the particular brand of religion referred to can achieve, for some, readjustments that cannot otherwise be attained. There were other victims of autocratic direction who refused to be discouraged by so undiscerning a judgment. They flourish in various other departments and schools of psychotherapy where training is more important than a high I.Q. The Clinic taught me more than I ever learned in private practice of the attitude of the general practitioner, and particularly of the panel doctor towards psychotherapy. On this frontier, as some of you have also learned, there was a strong tendency to regard psychotherapy as a form of magic. This has great inconveniences—particularly for the magician. But in the last few years the practitioner's outlook has improved immensely, and it is reasonable to suppose that it will continue to improve. At the Clinic, as in the nursing-home, one saw a variety of psychotherapeutic methods in action. The only difference was that they were being applied in unfavourable conditions as opposed to the favourable conditions of the nursing-home. This problem of institutional versus ambulant treatment is one that for the most part is settled by circumstances: most psychotherapists are working either in, or outside, an institution. Therefore all their patients tend to be treated on the one basis or on the other. The psycho-analyst is inevitably bound to a method of treatment from which coöperation with the environment is excluded. But my experience has taught me that far more skilful and frequent use should be made of environment as an adjuvant of treatment by those psychotherapists who are free to do so.

Such then have been the peculiarly valuable experiences that have fallen to my professional lot. I feel, looking back, as if I had been for 36 years a professional waste-paper basket. And if such a receptacle is endowed with ears, eyes, and memory even of second- or third-rate quality it is bound to register some very interesting observations. Not the least interesting is the opportunity of observing the activities of the fellow or fellows who treated the patient before he was relegated to the waste-paper basket. Through these opportunities I have learned much that is admirable of many of my colleagues, and of others certain things that make me feel impatient and indignant. But of this I am very convinced, that the medical men and women who in any capacity treat functional cases lack nothing in heart however limited they may be in head. Indeed their compassion is too often exploited by the malingerer, and if they appear impatient with anxiety cases it is only because they are unable to understand them.

I would not wish to close the list of my professional opportunities without referring to one which lies on the frontier of psychotherapy. I refer to the privilege and discipline in child guidance that are associated with parenthood on, shall we say, a generous scale. The matter is not merely of social significance. Now that parenthood is becoming almost pathological in

its infrequency, the psychotherapist has to deal increasingly with the products of the small family and its implications. But he himself has foregone an education to reality which only the cast-iron narcissism of the Victorian era could resist. The more I see of modern child guidance the more I see it reverting to those basic principles on which all good nurseries and all happy families have been conducted. To have shared in this family experience, whether as child or parent, appears to me to have been a particular privilege for any psychotherapist.

The main part of this address, which will appear in full in the *Journal of Medical Psychology*, was devoted to a discussion of neurology, physiology, sociology, philosophy, and religion as frontiers of psychotherapy.

OPEN-AIR SCHOOLS

Two activities of the Save the Children Fund (20, Gordon-square, London, W.C.1) mentioned in its seventeenth annual report deserve mention. For ten years now the Fund has maintained at Broadstairs an open-air residential school with accommodation for 52 girls, aged from 5 to 15 years. They spend three months each at Fairfield House, putting on 6 to 10 lb. in weight and doing "just so much school work as is necessary." Of the children 72 have come at the charge of local education authorities but free places have been provided for 87 children from various parts of the home counties. It is three years since the Fund began to equip non-residential nursery schools, and seven of these are now running with official recognition from the Board of Education. They are located as follows:—Tyneside: Byker (Newcastle), North Shields, Sunderland; Tees-side: Middlesbrough; West Riding: Leeds; South Wales: Dowlais (Merthyr Tydfil), Brynmawr. Recently the schools at Middlesbrough and North Shields have been enlarged, and plans passed for a new school at Hebburn. The one school still unrecognised by the Board is at Hoxton, where the school is sound enough but the premises are not up to the mark. The Fund has also given assistance to nine other nursery schools—namely, at Louth, Lincoln, Rochdale, Balham (London), Kentish Town (London), Harrow, Niddrie (Edinburgh), and Methil (Fifeshire). The report records the change in colour of the children from greyish-yellow to the normal pink and brown, and suggests that the children stimulate their mothers to adopt nursery-school standards at home.

MUNICIPAL YEAR BOOK.—This valuable year book [1] has undergone several changes in its format since the last edition. The directory of national and local authorities which hitherto preceded the general sections now occupies the second part of the book, and this has made necessary some rearrangement in the general sections. The book is a faithful chronicle of the developments and achievements of the past year and an encyclopædia of knowledge of local government administration. Its appearance this year in January instead of in March is very welcome.

CORRIGENDUM.—The reference in a leading article last week (p. 274) to a paper by Stamp and Hendry, published in the same issue, should have been to Dr. T. C. Stamp and Mr. Edward Hendry, Ph.D.

Vacancies

For further information refer to the advertisement columns

Accrington, Victoria Hosp.—H.S., £150.
Basingstoke, Park Prewett Mental Hosp.—Deputy Med. Supt., £600.
Bath, Royal United Hosp.—H.S. for Ear, Nose, and Throat Dept., at rate of £150.
Birmingham Ear and Throat Hosp.—First H.S., at rate of £150.
Birmingham, Little Bromwich Hosp. for Infectious Diseases.—Jun. Res. M.O., £300.
Birmingham, St. Chad's Hosp.—Jun. Res. M.O., at rate of £150.
Brighton, Royal Sussex County Hosp.—Hon. Med. Registrar.
Bristol, Frenchay Park Children's Orthopædic Hosp. and Sanatorium.—Res. M.O., at rate of £250.
British College of Obstetricians and Gynæcologists, 58, Queen Anne-street, W.—Res. Librarian, £400.
Bury County Borough.—Deputy M.O.H., £750.
Central London Throat, Nose, and Ear Hosp., Gray's Inn-road, W.C.—Res. H.S., at rate of £75.
Cheltenham General and Eye Hosps.—H.P., £150.
Chester Royal Infirmary.—Two H.S.'s, H.S., and H.P., each £150.
Chichester, Royal West Sussex Hosp.—Jun. H.S., £125.
Colonial Medical Service.—Thirty Vacancies, £600–£700.
Derby, Bretby Hall Orthopædic Hosp.—Jun. Res. Asst. M.O., £350.
Derbyshire Education Committee.—Asst. School M.O., £500.
Dewsbury and District General Infirmary.—Second H.S., £150.
East Ham Memorial Hosp., Shrewsbury-road, E.—Physician for Skin Dept.
East Sussex County Mental Hosp. Hellingly.—Sen. Asst. M.O., £550.
Home Office, Children's Branch.—Medical Inspector, £738.
Hosp. for Diseases of the Skin, Blackfriars, S.E.—Additional Member for Hon. Staff.
Ilford, King George Hosp.—Hon. Physician.
Italian Hosp., Queen-square, W.C.—H.S., at rate of £100.
Kingston-upon-Thames, Surrey County Mental Hosp.—Deputy Med. Supt., £720.
Liverpool, Alder Hey Hosp.—Res. Asst. M.O.'s, each £200.
Liverpool and District Hosp. for Diseases of the Heart.—H.P., £100.
L.C.C.—Asst. M.O.'s, Grade I and II, £350 and £250 respectively. Also Psychiatric Social Worker, £235–£12 10s.–£310.
London Hosp., E.—First Asst. to Ophth. Dept.
Maidenhead Hosp., Berkshire.—Hon. Surgeon.
Maidstone, West Kent General Hosp.—H.P., £175.
Manchester, Ancoats Hosp.—H.S., at rate of £100.
Manchester, Christie Hosp. and Holt Radium Institute, Withington.—Asst. Director, £1000.
Manchester, Crumpsall Hosp.—Res. Asst. M.O., at rate of £200.
Middlesex Hosp. and Medical School, W.—Jun. Med. Reg., £300.
Millwall (Isle of Dogs) School Treatment Centre, E.—Ophthalmic Surgeon, £80.
Newcastle General Hosp.—Venereal Diseases Clinic M.O., £800.
Newcastle-on-Tyne, Wooley Sanatorium, near Hexham.—Asst. M.O., £350.
Northampton, Mental Hosp., Berrywood.—Third Asst. M.O., £450.
North China, Missionary Hosp.—Medical Man.
Norwich, Norfolk and Norwich Hosp.—H.S. to Special Depts., £120.
Nottingham General Hosp.—H.S. for Fracture and Orthopædic Depts., £300.
Oxford, Radcliffe Infirmary.—Asst. Clin. Pathologist, £600.
Pembrokeshire County War Memorial Hosp., Haverfordwest.—Res. H.S., £200.
Plymouth, Prince of Wales's Hosp., Devonport.—H.S., at rate of £150. Jun. H.S. and Res. Anæsthetist and H.S. to Special Depts., each at rate of £120. Also Sen. H.S., at rate of £130.
Portsmouth Royal Hosp.—Cas. O. and H.P., each at rate of £130.
Preston, Biddulph Grange Orthopædic Hosp.—Jun. H.S., at rate of £200.
Princess Louise Kensington Hosp. for Children, St. Quintin-avenue, W.—H.P., at rate of £120–£150.
Queen Charlotte's Maternity Hosp., Marylebone-road, N.W.—Res. Anæsthetist, at rate of £100. Res. Anæsthetist and Dist. M.O., at rate of £90. Also Asst. Res. M.O., £80.
Queen Mary's Hosp. for the East End, E.—Hon. Asst. Physician to Psychological Medicine Dept.
Reading, Royal Berkshire Hosp.—Res. Anæsthetist, £250.
Rochdale, Birch Hill Hosp.—Jun. Res. M.O., at rate of £225.
Rochdale Infirmary and Dispensary.—Sen. H.S., £250. Also Second H.S. and H.P., each £150.
Rotherham Hosp.—Cas. H.S., £150.
Royal Cancer Hosp., Fulham-road, S.W.—H.S. to Radium Dept., at rate of £100.
Royal Naval Medical Service.—Vacancies for M.O.'s.
Ryde, Royal Isle of Wight County Hospital.—Jun. H.S., £120.
St. Bartholomew's Hosp., E.C.—Physician. Asst. Surgeon to Orthopædic Dept. Neurologist. Dental H.S., at rate of £80. Asst. Dental Surgeon. Also Chief Asst. to Dental Dept.
St. George's Hosp., S.W.—Res. M.O. for Convalescent Branch, at rate of £300.
St. John's Hosp. for Diseases of the Skin, Leicester-square, W.C.—Out-patient and In-patient Med. Registrars, each £50.
St. John's Hosp., Lewisham, S.E.—Res. H.P. and Cas. O., each at rate of £100.
Sheffield, Jessop Hosp. for Women.—H.S., at rate of £100.
South London Hosp. for Women, Clapham Common, S.W.—H.P., at rate of £100.
Stockport County Borough.—Sen. Asst. M.O.H. and Clin. Tuber. O., £750.
Sutton and Cheam Hosp.—Sen. and Jun. Res. M.O.'s, at rate of £150 and £100 respectively.
Truro, Royal Cornwall Infirmary.—H.S., £170.
West Hartlepool, Cameron Hosp.—H.S., £150.
West London Hosp., Hammersmith, W.—Asst. Pathologist, £300.
Wolverhampton Royal Hosp.—H.S., at rate of £100.
Woolwich and District War Memorial Hosp., Shooters Hill, S.E.—Res. M.O., £175. Also H.S., at rate of £100.
Worcester County and City Mental Hosp., Powick.—Asst. M.O., £350.

The Chief Inspector of Factories announces a vacancy for a Certifying Factory Surgeon at Ely (Cambs).

[1] The Municipal Year Book, 1937. Edited by James Forbes. London: The Municipal Journal Ltd. Pp. 1594. 30s.